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NOVEMBER 9, 1935

Railway Age

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Speed!

Comfort!

Safety!

at Low Cost!



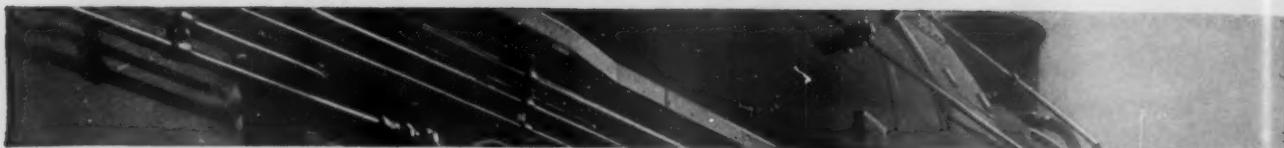
Are Selling the Public on Railway Travel!

MORE people are buying rail accommodations today than in many years. This is shown by the marked increase in railway passenger revenues.

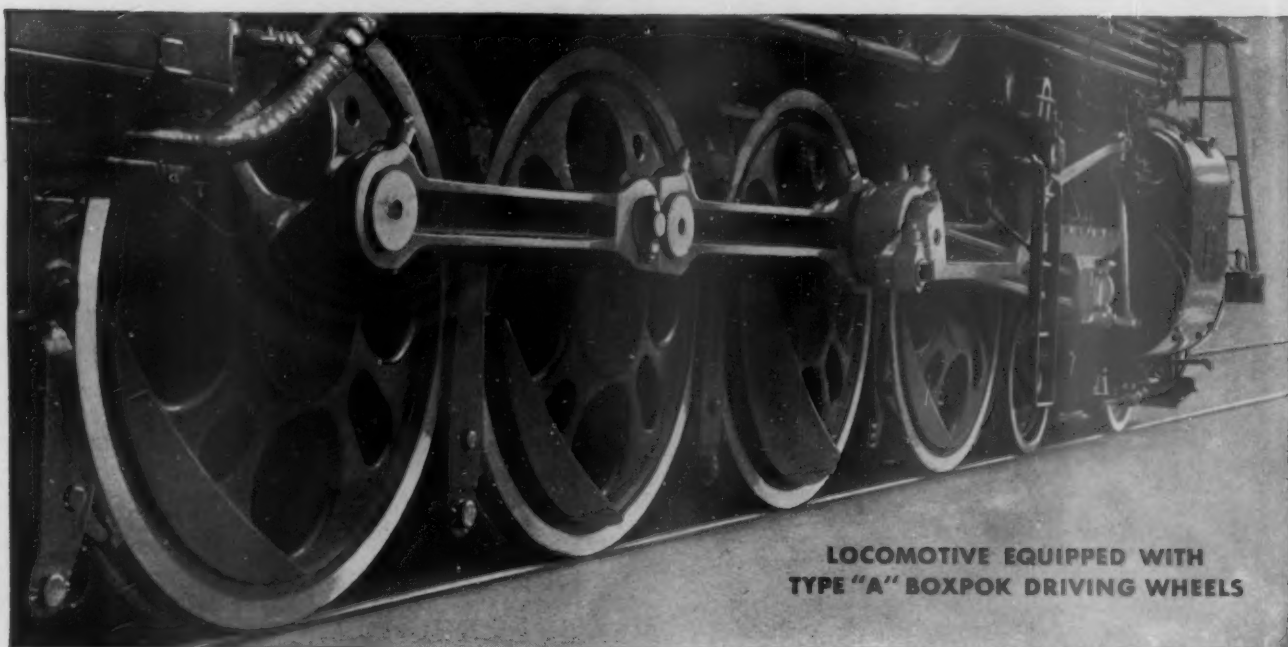
The progress in regaining passengers on certain roads and in certain sections of the country is proof that the railways can make further large increases in passenger revenues by doing on a nationwide scale the things that they have done so successfully on a small scale to win back passengers.

In this connection the *Railway Age* will publish on November 30, a Passenger Traffic and Equipment issue which will show by facts and figures, the effect on traffic volume and revenue of innovations in modern equipment, rate policies and merchandising methods.

Be sure to get a copy of the
November 30 issue



The Solution to **DRIVING WHEEL PROBLEMS**



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BOXPOK **DRIVING WHEEL CENTERS**

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Box-Section Rim Construction Prevents Out-Of-Round Wheels and Flat Spots — Increasing Tire Mileage.

Provide Additional Counter-Balance and Cross Balance Where Needed, Allowing Higher Locomotive Speeds with Reduced Track Stresses.

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RAILWAY AGE

Make the Old Dealers Honest

The New Deal and those opposed to it are aligning themselves for what promises to be a great sham battle regarding the future of capitalism—i.e., of private property and enterprise. It promises to be a sham battle because apparently the issues will not include government policies affecting the railways, which present the most formidable single political and economic problem confronting the nation.

The danger of government ownership of railways is more real than that of permanent adoption of any socialistic policy that the New Dealers now favor and the Old Dealers oppose, and its adoption would deal a more deadly blow to the entire system of capitalism in the United States than adoption of any other policy now advocated. It would immediately transfer more than one million persons from private to government payrolls and add at least \$20,000,000,000 to the government debt. It would enormously increase government deficits and greatly increase the difficulty of reducing them. It would give the government a new and permanent power of dictating details of management to innumerable industries by making it the annual purchaser from them of from \$1,000,000,000 to \$2,500,000,000 of railway equipment, materials and fuel. And yet those responsible for the tumult and shouting about the danger of New Deal socialization of other industries are silent about the much greater danger of government ownership of railways.

Danger of Government Ownership Due to Old Dealers

The reason is plain: *The political and business opponents of the New Deal are principally responsible for the policies causing danger of government ownership of railways* although the New Deal policies have increased the danger. The Old Dealers cannot discuss the subject without stultifying themselves in one way or another. They cannot advocate it because they profess to be opposed to all socialistic policies. They cannot effectively argue against it because this would necessitate showing that the very government transportation policies for which they themselves are principally responsible, and which many of them still favor, are the principal reasons for the danger of government ownership. They don't want government ownership; but, in their own supposed selfish political or business interest, many of them want continuance of the government subsidization of air, highway and water transportation, the unequal regulation of competing carriers, and the unequal wages and working conditions that make the labor costs of other carriers much less than those of the railways. They don't want state socialism—at least, so they say—but they won't

say or do anything worth while to prevent the longest single advance that could be made toward it, because that would involve saying or doing things that apparently might temporarily be bad politics or bad business for themselves.

The *Railway Age* is still in doubt as to whether the murder of capitalism in this country is more likely to be an outside or an inside job. We are inclined at present to expect that it will be the latter. The New Dealers make so many noisy announcements of what they are going to do that they awaken not only the family, but also the neighbors. The Old Dealers, being inside the house and more experienced, can proceed more hypocritically, stealthily and skillfully, and seem not unlikely to be able to consummate the murder just in time to let the New Dealers and socialists avoid the guilt of killing capitalism—and become his heirs! Private ownership of railroads is a vital part of the American system of capitalism, and the Old Dealers can not in any way do a more efficient job of murdering it than by continuing to ignore the essentials and realities of the railroad problem, and continuing, not only to attack, but to defend and support, the same socialistic and destructive policies for transportation that they oppose and denounce for other industries.

How Prevent Government Ownership?

How, then, prevent government ownership? Should it be made a political issue? It may become one in spite of the efforts of many Old Dealers to oppose and promote it at the same time. Senator Wheeler, a New Dealer, has introduced a bill for it; and a very significant fact that has been overlooked by most Old Deal critics and enemies of the railways is that the bill authorizes government acquisition, not only of the railways, but of *all agencies of transportation*. The Railway Labor Executives' Association has declared for government ownership and established an office in Washington to campaign for it during the next session of Congress. President Roosevelt, however, always has been understood to be opposed to government ownership, has supported legislation to mitigate the Old Deal policies principally responsible for the danger of it, and probably will prevent it from becoming a political issue.

It ought not to be made a political issue. There should be created a business and public sentiment so strongly opposed to policies tending to push the railways into it that both great parties will favor policies intended to prevent it. The initiative for that purpose should be taken by those who are most familiar and concerned with the railroad problem—railway manage-

ments, manufacturers of railway equipment and supplies, insurance companies and banks owning large amounts of railway securities, banks that have sold large amounts of railway securities to the public, large and small individual owners of railway securities. They should join collectively and individually in a huge educational campaign.

The first persons they should try to educate are the Old Dealers of big and small business throughout the country who are promoting government ownership of railways by tolerating or openly and actively advocating for the railways as socialistic and destructive policies as the New Deal policies they are opposing for other industries. Next they should tackle the leading politicians of both parties, make them understand the real issues involved in the railroad problem, and try to apply to them the pressure of the organized investors in railways, and as nearly as practicable the pressure of the organized investors in all industries, in behalf of government policies that will help to prevent government ownership by helping to make the railways a self-supporting industry. This means government policies that will not subsidize competition with the railways, that will not regulate them as their competitors are not regulated, that will not support much more costly wages and working conditions for employees of the railways than for employees of their competitors. And, of course, the issues raised by the railroad problem and the drift toward government ownership should be presented in ways and through channels that will reach the entire voting population. It will do little good to present them merely to business men and politicians.

Improved Business and the Railway Wage Problem

And sooner or later railway managements must tackle the wage problem unless business is soon going to improve greatly. It is improving now. Is it going to improve fast enough to enable them to weather the storm while carrying the heavy cargo of present wage scales? They expected it would when present wage scales were restored, but the improvement stopped. One reason was the reduction of their own employment and buying caused by their own advance in wages.

The current improvement in business appears more real and substantial than any since that which began in the same part of 1932 and which was interrupted first by the banking crisis, and then for two years by the New Deal. The increases in average weekly car loadings between July and October in 1932 and 1935 were relatively almost the same—31 per cent in 1932 and 29 per cent in 1935. The increase in 1932 was from 483,176 weekly in July to 633,512 in October; in 1935, from 557,184 in July to 720,481 in October. Each increase was much larger than occurred in any other year of the depression and, what is much more important, about twice as large relatively as a normal seasonal increase during the same period in years of prosperity, showing that the trend was strongly upward. (Parenthetically, it may well be asked: If the improvement in business causing the recent increase in car loadings has been due, as claimed by the New

Dealers, to their policies, why a relatively larger increase occurred in 1932, a year before the New Deal began?)

Comparison of the increases in net operating income caused by the increases in car loadings in 1932 and in 1935 is interesting. In 1932 net operating income increased from \$11,600,000 in July to \$28,400,000 in August; \$49,600,000 in September, and \$64,000,000 in October. Net operating income in 1935 was \$27,000,000 in July, \$42,000,000 in August and \$57,400,000 in September. The increase in 1932 in September over July was 328 per cent and in 1935 only 114 per cent, although the increase in car loadings was 19 per cent. Under the New Deal gross earnings increased less in 1935 and operating expenses more. However, it seems reasonable to expect that when the net operating income earned in October, 1935, is reported, it will be found to have been larger than in any month of any year since October, 1930.

Fate of Capitalism—Will It Be A Sham Battle?

In years before the depression a normal, or more than normal, increase of car loadings in the fall months almost invariably was a forerunner of a largely increased traffic during the subsequent year. The banking crisis in the first quarter of 1933 interrupted the improvement that occurred throughout the last one-third of 1932. There is no prospect of any equally serious crisis interrupting the improvement now occurring, and it will be gratifying if it is lasting and great enough to justify continuance of present railway wage scales. They should not be continued unless there is early evidence that it will be. The railways should not continue to drift toward general bankruptcy and government ownership because of fear to make legitimate and businesslike efforts to save themselves. That is one way to help destroy capitalism and establish state socialism.

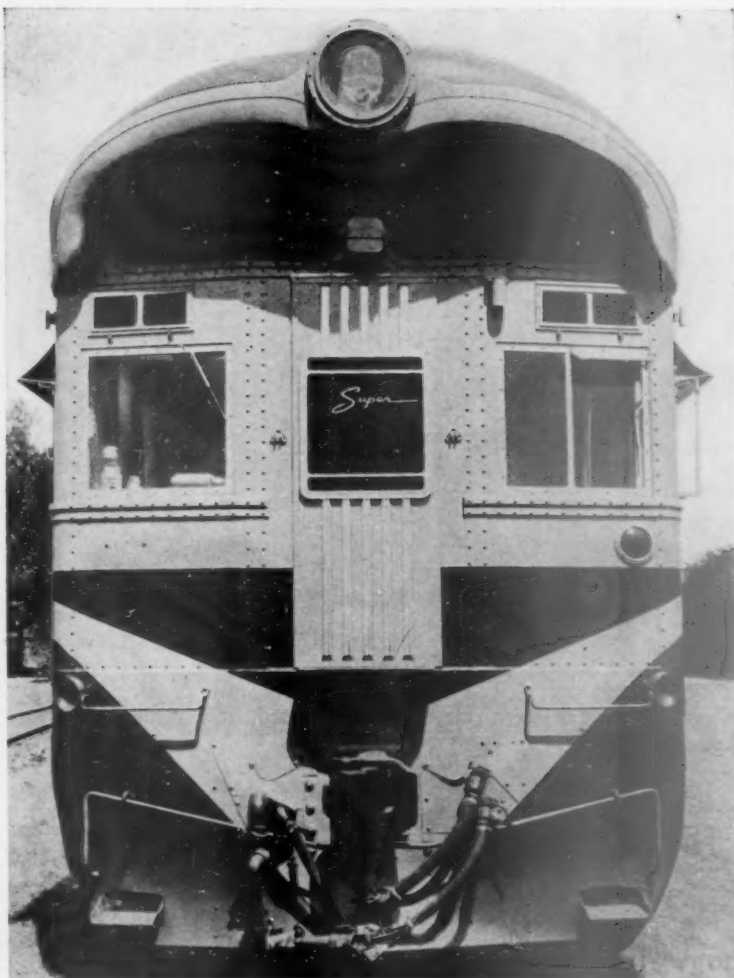
The next national election will occur in a year. Its result may determine the entire political and economic future of the United States. The battle to be fought meantime should not be a sham battle. Many politicians and business men want to make it a sham battle by evading the extremely inconvenient railroad question.

This is especially true of the Old Dealers. They have benefited greatly, or think they have, and hope to benefit in future, by political and economic exploitation of the railways.

Why should they have their oratorical style cramped by loud outcries from the audience asking whether they are really opposed to socialistic policies for *all* business and industry, *including the railroads*? They should have it thus cramped now because there is an opportunity there may never be again to make them go on record against the kind of socialistic transportation policies they themselves have foisted on the country and that they will continue hypocritically and selfishly to favor unless forced to become consistent. The principal thing that needs to be done before the next national political campaign gets well under way is to make the Old Dealers honest.

Santa Fe's New Diesel Makes Record Run

Hauls nine-car train of conventional heavy steel construction from Los Angeles to Chicago in 39 hr., 34 min.



LEAVING Los Angeles, at 5:00 a.m. Wednesday morning, October 16, on an unannounced test run, the 3,600-hp. Diesel-electric locomotive, recently delivered to the Atchison, Topeka & Santa Fe by the Electro-Motive Corporation, made a record run to Chicago, hauling a nine-car train of conventional heavy steel passenger cars. The arrival time at Chicago was 10:34 p.m. Thursday evening, the train thus completing a run of 2,228 miles in a total elapsed time of 39 hr., 34 min., including 11 scheduled stops. This constitutes a record long-distance run for any train of standard steel equipment. Over 15 hr. was cut from the time of the Santa Fe's "Chief," the fastest regular flyer between Los Angeles and Chicago; while 5 hr., 20 min., was cut from the record of 44 hr., 54 min., made between the same points by Death Valley Scotty's famous special train in 1905, a record which has stood unchallenged for nearly 30 years.

The performance of the Diesel-electric locomotive is notable because of the heavy train handled, over 720 tons, and the fact that no extraordinary preparations were made in advance. The train was returning to Chicago on the second of two routine test runs, during which the performance of the locomotive in high-speed heavy passenger train service was being studied. While greatly pleased with the results of the test run and particularly the comfortable riding equipment even at maximum speeds of about 100 m.p.h., Santa Fe officers say that it is not contemplated to operate regular passenger service between Chicago and Los Angeles on the basis of the record time made. The schedule of the Santa Fe's pro-

posed new train, "The Super-Chief," which the powerful locomotive is designed to draw, will, however, undoubtedly be several hours faster than existing schedules between these points.

Description of the Locomotive

The new Diesel-electric locomotive was designed by engineers of the Electro-Motive Corporation, General Motors subsidiary, in conjunction with the Santa Fe, and built at the St. Louis plant of the St. Louis Car Company. It is the largest and most powerful locomotive yet arranged to be driven by internal combustion engines, although a similar Electro-Motive Corporation double-unit locomotive of the same power is now being tested on a number of roads and a single-unit locomotive, of the same design and developing one-half the power, was placed in test service on the Baltimore & Ohio several months ago.

The Santa Fe Diesel-electric locomotive is a multiple-unit of two identical sections. The complete locomotive is 127 ft. 8 in. long between coupler-pulling faces, weighs 250 tons and has a tractive force of 120,000 lb. at starting and 19,000 lb. at a speed of 60 m.p.h. The width overall is 9 ft. 9 $\frac{3}{8}$ in., height overall 14 ft. 3 in., truck wheelbase 8 ft. 6 in., truck centers 40 ft. and wheel diameter 36 in.

The two locomotive units are streamlined, for appearance, with sloping ends, and all apparatus is concealed. A skirt extends around the locomotive, blending the pilots in graceful contours. The headlights also are streamlined, being built into curved receivers in the



The 3,600-Hp. Diesel-Electric Locomotive Recently Delivered to the Santa Fe by the Electro-Motive Company

roof of each unit. The superstructure is built of steel shapes and Cor-Ten rolled plates riveted and welded together.

The locomotive is arranged for double-end operation with an operator's cab at each end of each unit. The engine-room compartment is separated from these cabs by steel partitions fitted with swinging doors. These doors are located back of the cab side entrances to afford easy entrance and exit from each operator's compartment. All windows in the operators' cabs are glazed with safety-glass. Front windows are equipped with windshield wipers and cab side windows have sliding and drop sashes. The control station of each cab is so located as to afford the operator a clear view of both sides of the track, which promotes greater safety and ease of operation.

The engine compartment is especially designed for ease in the inspection and maintenance of equipment. Ample room has been provided around all pieces of apparatus. Aisleways extend from cab to cab along both sides of the locomotive and are free from obstruction. Large drop sash windows furnish plenty of light. The roof above the engine compartment is made up of removable sections to facilitate removal of the larger pieces of apparatus when necessary.

The underframe is a Commonwealth one-piece steel casting, with end sills cast integral and so designed as to withstand all stresses to which it will be subjected in ordinary service. There are suitable openings throughout for piping, wiring, and conduit. At all points where stresses occur, extra ribbing has been provided.

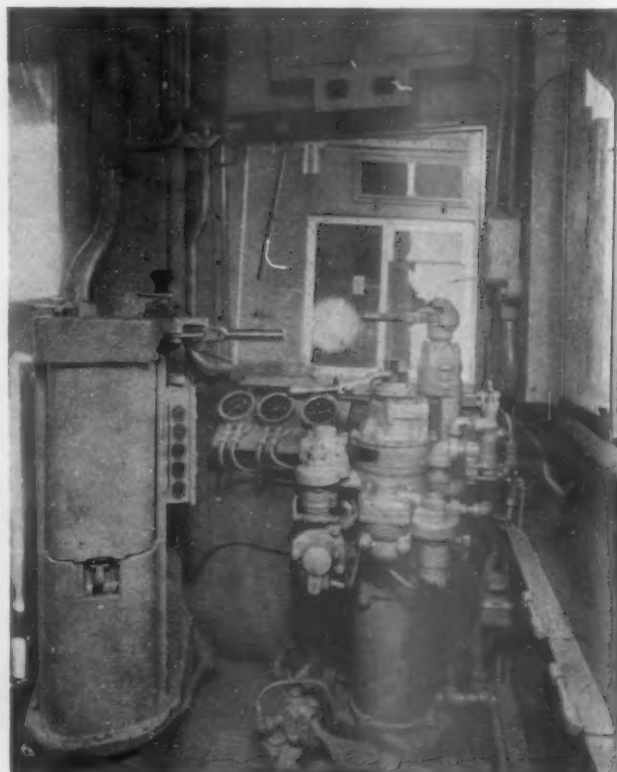
Two four-wheel swivel trucks, with 36-in. wheels and 6½-in. by 12-in. plain journals, support the underframe on 18½-in. center plates spaced 40 ft. apart. The rigid wheelbase of each truck is 8 ft. 6 in. The truck frames are of the swing bolster type with Commonwealth cast steel frames.

The locomotive is equipped with the Westinghouse 8-EL straight and automatic air brake schedule, modified to permit the installation of a continuous railway control system. Clasp brakes, fitted to all wheels, are operated by four brake cylinders per truck. Sand boxes are located in the engine room for sanding the front wheels of the leading truck.

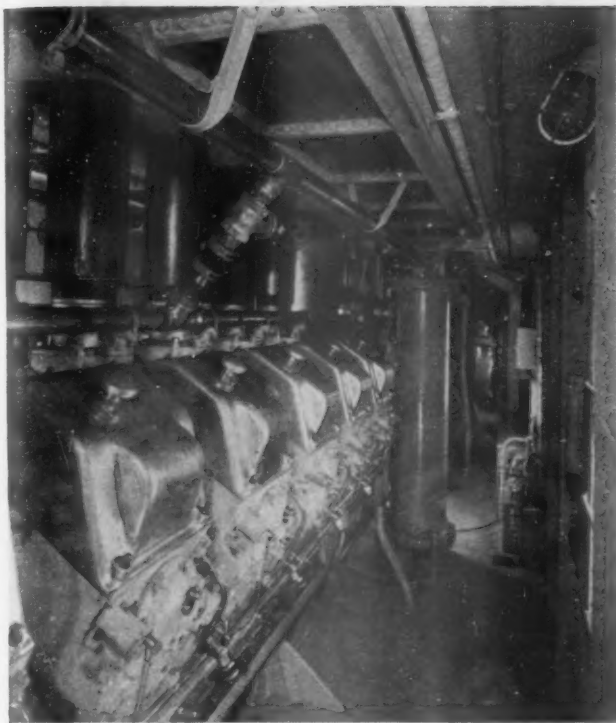
The steam generator provided in each unit for heating and air-conditioning the trailing cars was produced

especially for this locomotive by the Vapor Car Heating Co. It is a light-weight, compact, automatic unit and draws its fuel from the same storage tanks that supply the power plant. It has an evaporation capacity of 2,000 lb. of water per hour and a working pressure of 200 lb.

The locomotive boiler water capacity is 1,250 gal., provided in four rectangular tanks hung symmetrically about the center lines outside the center sills. These tanks are heavily insulated to prevent the water from freezing in cold weather. They have a common water-filling manifold fitted into the car roof in the center of the locomotive. By lifting the hatch cover to this



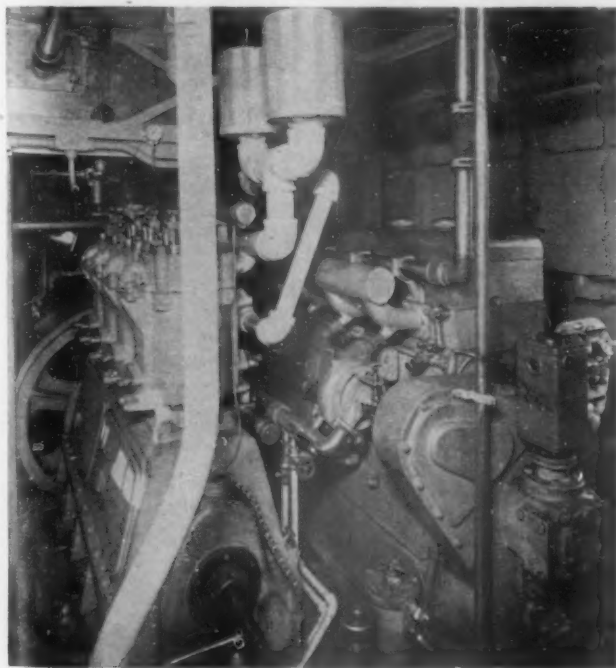
Arrangement of Control Equipment at One of the Operator's Stations



One of the Winton 900-Hp. Diesel Power Units in the Engine Room

Principal Features of the Power Plant

Motive power for each unit is supplied by two 900-hp. oil-electric power plants mounted on the underframe directly over each center plate. The combined rating of these two power plants is 1,800 hp., a total of 3,600 hp. for the two units, and all of this power, except for necessary losses in transmission, is available for traction purposes. The power required by auxiliaries is either sup-



Auxiliary Power Equipment Located in One of the Locomotive Engine Rooms

plied by auxiliary engines or taken from the main engines in excess of their rating.

The main engines comprise two Winton V-type, 12-cylinder, high-compression, two-cycle oil engines of 8-in. bore and 10-in. stroke. Each of the engines is conservatively rated at 900 hp. at 750 r.p.m. These engines are extremely light in weight, weighing less than 20 lb. per hp., this notable saving in weight over the usual type of Diesel engine being effected by incorporating several improved features of construction. The uniflow principle of scavenging, which is utilized, permits the use of a two-cycle stroke at greater efficiency than is generally obtained in engines of this type. The welded steel crankcase construction, which is stronger than the usual cast-iron frame, provides a great saving in weight.

Another feature of note is the patented unit-injection valves which assure complete atomization of fuel in the cylinders. All working parts of the engine are readily accessible without dismantling the complete engine. Convenient hand-hole covers permit access to the connecting rods and main bearings. Cylinders have individual heads and removable liners. All working parts are designed to require a minimum of maintenance, and also to permit such maintenance being done in the average railroad shop with its present type of equipment and personnel.

Each engine cooling system consists of a series of fin-tube radiators, water circulating pump, and air circulating fans for radiator cooling. The cooling radiators are arranged in two long sections of coupled units hung parallel to the power plant, and supported by the underside of the engine-compartment roof. Each engine receives its water from a common water supply tank, located in the center of the car below the level of the radiators to permit self-draining of the radiators during cold weather. Provision has been made to keep this water warm when the locomotive is not in service by admitting steam from the heating system into the engine water jackets.

Air is drawn into the engine compartment through grilled openings at each end of the locomotive, and forced by means of large engine-driven fans through the radiators. After passing through the radiators, the air leaves the locomotive through a series of vents, into the exhaust-manifold well in the roof.

Lubricating Oil System—Fuel System

The lubricating oil system of each engine consists of a supply tank, a water cooler, circulating pumps, strainers, and filters. Two sumps, one at each end of the engine crankcase are fitted with removable strainers. A dual scavenging pump draws the hot oil from these sumps and passes it through a large capacity water jacketed oil cooler to the oil supply reservoir. Here it is filtered, and then taken back to the engine by means of a pressure pump. The pressure is regulated by a relief valve. Provision is made on the engine to close the engine throttle in the event of deficient oil supply.

Fuel for the engines is carried in two 400-gal. storage tanks located under each unit, a total of 1,600 gal. for the two units. These tanks are equipped with efficient strainers and filling manifolds to provide quick refueling without elaborate equipment, and can be filled from either side of the locomotive. Fuel is delivered to the engines by means of motor-driven fuel pumps. A 25-lb. pressure head, maintained on the fuel header, is regulated by a spring-loaded by-pass valve which empties into the fuel tanks.

An exhaust muffler is mounted in a well located in the roof over each engine. Individual stacks from each

(Continued on page 611)



Drying Up the Roadbed

Extensive program of major drainage operations on the Pennsylvania, started in 1928, is paying large dividends in smoother, safer and more economically maintained tracks

An Example of the Cut Widening and Ditch Reshaping Done on the Central Region

In spite of the general recognition of the primary importance of adequate drainage to the economical maintenance of safe, smooth-riding track, few roads have given as much attention to this subject as the Pennsylvania where drainage problems have been attacked on a major scale for a number of years. In the years 1928 to 1930 particularly, this road carried out a comprehensive program to dry up the roadbed, a program of major operations which is still under way, although curtailed in scope of necessity during the last three or four years.

In these years, all three regions and the New York Zone of the road made a concerted attack on water within or about the track, and on conditions which interfered with the rapid removal of rainfall from the entire roadbed area. Tracks were raised on new cinder sub-ballast; cuts were widened and re-sloped; ditches were enlarged, deepened and re-pitched; corrugated pipe and treated wood subdrains were installed beneath and along the tracks to tap and drain wet spots and water pockets, and more than 2,000 track miles of stone ballast were completely renovated by mechanical means to insure free-draining track. In more recent years, with much of the heavy ditching and cut widening out of the way, increased attention has been given to subdrainage, which has resulted in the installation of hundreds of lateral drains beneath the tracks. At the same time there has been little let-up in the persistent attack on routine drainage maintenance problems, including ditch maintenance and ballast cleaning. As a matter of fact, the system expenditures for operations affecting track drainage have continued to assume a relatively large part of the total maintenance of way expenditures, and the program of ballast cleaning has been at a peak since 1929.

Large Ditching Program Started in 1928

While adequate drainage was not a new thought to the Pennsylvania when it embarked on its major drainage program in 1928, the time seemed propitious to tackle on a wide front many of the conditions which prevented adequate drainage of certain sections of the roadbed and which were known to be the direct cause of increased track maintenance expense. Scattered

over the system were earth cuts at many points so narrow as to cramp side ditches and to impede drainage, in spite of routine ditch cleaning operations; many cut slopes were either too steep or inadequately protected by berm ditches, which permitted material to wash into the side ditches; many miles of side ditches themselves required widening and deepening, and many new and enlarged culverts were required to carry off the water from adjacent drainage areas, ditches and lateral streams. Such conditions existed more or less generally over the road, but, in addition, certain parts of the system were confronted with the even more serious problems of consistently wet track and of peculiar track subgrade conditions which permitted the formation of water pockets.

The large program of major ditching, cut widening and slope reshaping, designed to promote the rapid removal of water from the roadbed and to stop the sloughing off and sliding of cut slopes into the side ditches, once started, was soon extended to all of the regions. By 1930, when practically all of the worst conditions had been cleared up, this work had directly affected approximately 30 miles of cuts on the Eastern region, approximately 27½ miles on the Central region, approximately 14 miles on the Western region, and a sizable mileage on the New York Zone, between New York and Philadelphia. Most of the cuts treated were relatively short and shallow, but many were more than a mile in length, and some were as deep as 70 ft. in places and required as much as 25,000 to 75,000 cu.yd. of excavation.

Throughout most of this work standard ditches were



Deep Ditching With a Gasoline-Operated, Crawler-Mounted Dragline on the New York Zone, August, 1935



A Well-Drained Cut on the Baltimore Division—Note Berm Ditch and Paved Side Ditch—There Are 11 Sub-Track Cross Drains in This Cut

provided, with side slopes corresponding to the angle of repose of the material encountered, but in many cases, where the track appeared to be particularly wet, deeper ditches were provided in an effort to draw the water from the roadbed. Wherever the natural slope of the ground above cuts was toward the tracks, berm ditches of ample size were provided just back of the top edges of the cut slopes. These were made either to drain to the ends of the cuts or over lateral paved drains into the side ditches. Where there was any possibility of the new side slopes washing, some form of protection was afforded. In some cases the slopes were seeded with a mixture of deep-root grasses, and at some places the seeded areas were promptly covered with a layer of cinders, this having been found particularly effective in preventing wash and in enabling the seed to take hold. At other points the areas seeded were covered with mushroom soil to stimulate growth. At many points, where conditions indicated the possibility of wash in spite of other precautions, honey-suckle plants were set out to help stabilize the slopes.

While this class of work was done generally over the system, one of the largest programs of cut widening and ditch reforming was done on the 100-mile low-grade freight line between Columbia, Pa., and West Morrisville, N. J. Within this territory, where conditions at the time the line was built apparently did not justify construction to main-line standards, the cuts, as a rule, were narrow and the ditches were of insufficient depth. As a result, drainage was poor generally, causing miles of soft track which required a disproportionate amount of maintenance to keep it in good condition. Between Thorndale, Pa., and West Morrisville, approximately 40 miles, known as the Trenton cut-off, one of the cuts widened and reshaped was approximately 5800 ft. long and had a maximum depth of 55 ft.

Most of this heavier cut widening and ditching work over the system was done under contract because of its extent and the large amount of special excavating equipment which was required, and it is of interest to note that most of it was done without work-train service, or without otherwise occupying the main tracks.

For the most part the contractors used crawler-mounted cranes and draglines, and tractor bulldozers, operated above the cuts, which either wasted the excavated material or loaded it into auto trucks for disposal. At a number of points crawler-mounted steam shovels were used effectively without blocking the main tracks and, in some cases, where space permitted, narrow-gage dump cars were employed. In a number of other cases, little-used sidings were taken up to make room for an adequate ditch, without incurring the expense of widening the cuts and, in some instances, of the purchase of additional right-of-way.

Extensive Pipe Subdrainage Work

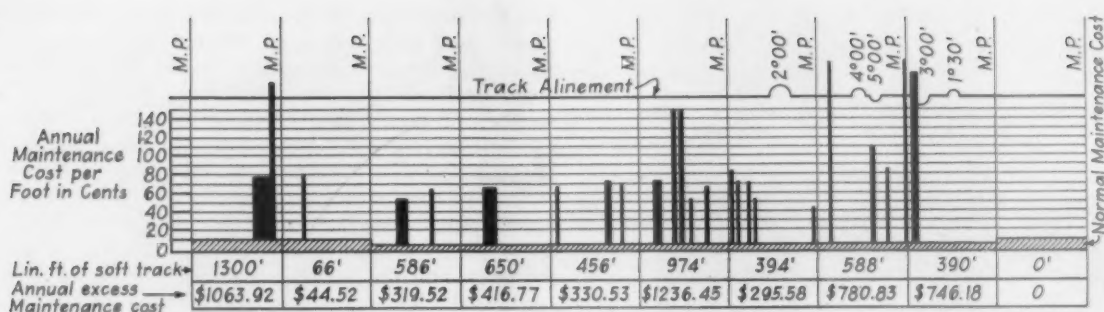
While the heavy cut widening and ditching work was common to all parts of the system, possibly the least extensive work of this character was necessary on the Western region, a large part of which is in relatively flat country involving mostly shallow cuts. However, this very topographical condition made natural drainage poor on many parts of the region and, combined with a peculiar impervious subgrade throughout many sections, permitted the formation of innumerable water pockets beneath the tracks.

This condition, while not confined to any particular territory, was particularly aggravating on the high-speed Fort Wayne branch, comprising part of the main line to Chicago. Here, due to stretches of soft track, the line was dotted with slow orders, many as low as 15 miles an hour, and this in spite of constant extra maintenance effort to permit safe operation at higher speeds. The extent of this extra maintenance effort is visualized more clearly when it is known that at many points it was necessary to pick up the same low spots and low joints as frequently as two to three times a week.

The worst condition on this line existed between Richmond and Adams, Ind., a stretch of approximately 86 miles. Here, in generally flat territory, the track is supported on a subgrade consisting largely of blue clay which is highly impervious and of low stability when wet. The ballast consisted chiefly of cinders and gravel. A careful investigation of conditions in this territory showed that altogether there were approximately 27,000 ft. of soft track and that approximately 95 per cent of it was caused by water pockets, or water trapped in the subgrade. The investigation also brought to light most forcefully that the extra work required to maintain this soft track in a safe condition was costing approximately 75 cents a foot a year, seven to eight times the cost of maintaining normal dry track in the same territory, or a total excess maintenance cost of approximately \$20,000 a year.

At the time the investigation was made, drainage systems, involving the tapping of the water pockets by means of lateral systems of perforated, corrugated pipe, were laid out for all of the sections of track involving the highest maintenance costs. These were listed according to their importance and a start was made by the regular section forces to correct conditions at the worst locations.

In the latter part of 1933, still confronted with the major part of the work, the installation of the drainage systems was turned over to the drainage contractor who had made the original detailed investigation of drainage conditions on the line. As a result, by 1934 more than 14,000 lin. ft. of the worst wet track had been drained and dried up, the work consisting essentially of installing perforated corrugated pipe laterals beneath the track at intervals of from 20 to 30 ft. throughout the affected areas, with such ditching as was necessary to collect and



Section of Chart Prepared of Soft, Wet Sections of Track on the Fort Wayne Branch, Showing the Lineal Feet Affected Per Mile and the Excess Track Maintenance Cost Yearly Before They Were Drained. Note: Total Footage of Soft Spots in 86 Miles, Richmond, Ind., to Adams, 27,054 Ft.—Total Excess Maintenance, \$20,317

carry off the water. In some cases, lines of pipe were installed longitudinally beneath the side ditches or beneath the center ditch between tracks. In all cases, the pipe was installed well below seepage seams and the bottoms of water pockets, and was surrounded, top and sides, with porous material.

In addition to this subdrainage work, approximately 30 miles of track in this territory was raised on a blanket of cinders to insure ready sub-ballast drainage and thereby prevent the formation of new water pockets.

Many Acute Conditions Corrected

While permanently curing the worst wet track in this territory, local soft spots of varying magnitude were drained permanently at a number of other points on the Western region. One of the outstanding examples of such work, both in size and in interest, was the subdrainage of a high clay fill approach to a bridge near Marshall, Ill., which, ever since its construction in 1928 in connection with a line change, had a tendency to slide and settle. Although only approximately 400 ft. long, the extra maintenance of this fill, including labor, work-train expense, watchmen and attempts at subdrainage, had cost approximately \$25,000 by the end of 1932.

Early in 1933, with little apparent improvement in the stability of the fill, drainage specialists were called in to correct conditions permanently. As a result, four separate systems of subdrainage were provided to tap the wet areas and water pockets which had persisted and enlarged with every sizable rainfall. Altogether, 1,733 lin. ft. of corrugated pipe, some perforated and some not perforated, from 8 in. to 36 in. in diameter, was installed in the fill, the smaller diameters of pipe being used as collection lines for the larger receiving or discharge lines. All of the systems were highly effective in draining large quantities of water from the embankment initially, and for a month or more following their installation they were

still discharging from 39 to 450 gal. of water per hour. One of the systems, involving 180 ft. of 36-in. pipe and a large number of 8-in. pipes projecting laterally as well as upward in the fill, discharged approximately 190,000 gal. of water within 50 days from the time the work was started.

For a time following the completion of the drainage systems, some settlement of the embankment took place, attendant upon the solidification which followed the release of the large volume of water. However, the severe sliding was effectively stopped and the embankment soon became firm and stable.

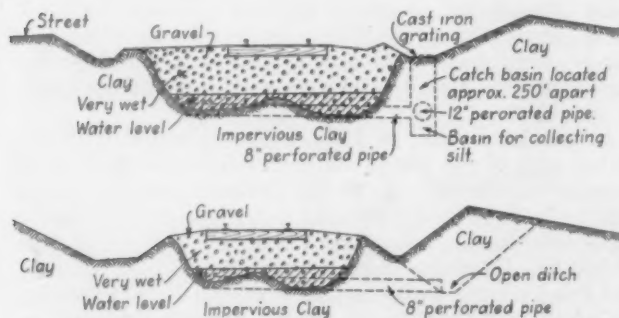
Extensive Work on Central and Eastern Regions

On the Central region, one of the major pieces of work undertaken to improve drainage was the raising of many miles of track, especially on the Panhandle division between Pittsburgh, Pa., and Columbus, Ohio, to pull it up out of low, worn and wet gravel ballast. On this division alone, between 1927 and 1929, a continuous stretch of 53½ miles of double-track main line was raised. Throughout this entire territory, which is relatively flat, the addition of new ballast and resurfacing had proved expensive and of only temporary benefit. Therefore, here the track was raised 2½ ft. out-of-face, first on 18 in. of cinders to provide a free-draining subgrade and, later, on an additional 12 in. of crushed rock, put down in successive lifts of 8 in. and 4 in. and thoroughly tamped with power ballasters.

During this same period the same treatment was given to about nine miles of double track on the Eastern division of the Central region. Here, however, the poor drainage condition was not general and the work, therefore, was confined to specific sections of varying length.

One of the major special problems on the Eastern region has been that of water pockets, especially between Philadelphia and Washington, D. C. Here, the condition was more or less similar to that which existed on the Fort Wayne branch of the Western region. Through many cuts, the ground beneath the tracks consists of a red plastic clay, which, although stable when dry, becomes a slippery, spongy mass when saturated with water, which is readily displaced under pressure.

Under the lighter loads and slower speeds of earlier years, the problem presented by the subsoil was not particularly serious and was solved quite successfully by a liberal section of stone ballast to distribute the loads and a limited amount of additional maintenance to keep the tracks in good surface. In more recent years, however, with the continued increase in axle loads and in speeds of both passenger and freight trains, the tracks, under the greater impacts to which they are subjected, settled constantly at a number of points, pushing the



Typical Water Pocket Conditions Found on the Fort Wayne Branch and Method of Drainage with Corrugated Perforated Pipe

clay subsoil up through the shoulders and into the side ditches. The addition of stone ballast to restore the track level proved to be only a temporary remedy, particularly if the clay forced on to the shoulders and into the ditches was removed in an attempt to restore the efficiency of the ditch drainage.

Especially deep ditching was done at a number of the points giving the most trouble, with the hope of lowering the water level beneath the track materially. This afforded some relief in most instances, but a careful investigation of a number of the soft stretches of track which persisted, disclosed the existence of many water pockets beneath the track, the water in which could not escape through the clay laterally into the side ditches, even though the bottoms of the ditches were well below the bottoms of the pockets. Finding this condition, it was obvious that the only effective remedy of a permanent character would be to tap these pockets with lateral drains extending into low-level longitudinal drains beneath the side ditches.

While the system of drainage employed here has been similar in principle to that used on the Western region, and also at many other isolated points over the system, the specific method and materials used have been somewhat different in many instances. Here, the draining of the pockets has been largely by means of sloped cross trenches at each pocket, in which a 12-in. layer of cinders has been placed 24 in. below the lowest point of the pocket and covered by a treated timber mat. Where deep open side ditches would create an unstable condition, treated wood box drains have been provided beneath normal side ditches to collect and carry off the seepage from the cross drains. These boxes have generally been made large enough to permit the passage of a man for cleaning.

While as indicated, most of the water pockets have been drained outwardly to subdrains beneath the side ditches, special conditions have made it advisable at a few points to slope the cross trenches and mats toward a box drain laid beneath the ballast in the inter-track space. This latter arrangement has proved desirable where there has been insufficient room for the ready construction of the drains beneath the side ditches, or where stations, platforms, or other roadway structures make it difficult to install side drains.

During the last three years the cross-trench and box method of subdrainage has been employed at 25 different locations on the Baltimore and Maryland divisions, involving a total of more than 300 cross trenches and mats. At one point the drainage system provided



In the Affected Areas on the Fort Wayne Branch, Perforated, Corrugated Pipe Laterals Were Spaced 20 to 30 ft. Apart

extends over a distance of approximately 2,100 ft. and involves a total of 101 cross trenches.

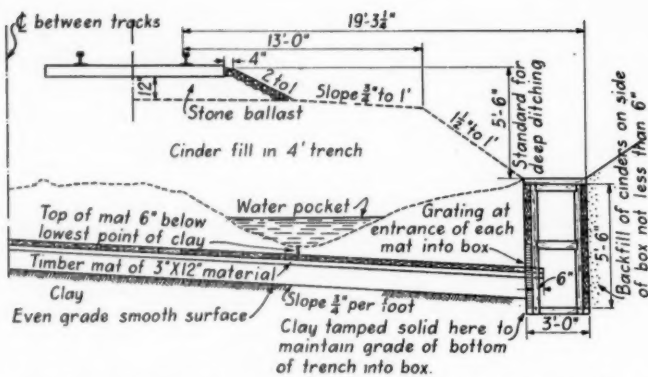
Routine Drainage Operations Not Neglected

While carrying out this large general program of major operations to get at the seat of long-standing drainage problems, the Pennsylvania has not overlooked routine ditch maintenance work and the necessity for cleaning ballast as essential to the maintenance of a free-draining stable roadbed. Concurrent with, and since the completion of much of the heavier work, a considerable part of the total appropriation for maintenance work has been spent each year for ditch maintenance, employing spreaders and crawler-mounted cranes and draglines capable of being operated both on flat cars and on the ground. At the same time, attention has been given to thousands of culverts and other structures carrying water beneath and away from the roadway, and also to drainage at highway crossings.

The importance attached to clean ballast is seen in the fact that for the last five or six years ballast cleaning has been one of the major items of maintenance-of-way work on all of the regions. Employing effective mechanical equipment in all cases, a total of 1,471 miles of border and more than 6,000 miles of center ditch ballast were cleaned in the years 1929 to 1934, inclusive, an average of approximately 245 miles of border and 1,000 miles of center ditch ballast each year. Significant also is the fact that the program for 1935, which called for the cleaning of 350 miles of border and 1,100 miles of center ditch ballast, exceeded that of any previous year, except



The Resloping of Cut Banks to Stop Wash into the Side Ditches Has Been Done at Hundreds of Places Over the System



Cross Section Showing Details of Timber Mat and Ditch Manhole Box Used Extensively on the Eastern Region to Tap and Drain Water Pockets

1932, when 409 miles of border and 1,112 miles of center ditch were cleaned.

Large Return on Investment

What have been the results of this major attention given to drainage on the Pennsylvania? Much of the results, both direct and indirect, cannot be expressed directly in dollars and cents, but, on the other hand, in many cases the savings alone in reduced routine maintenance costs have represented a substantial return. All over the system where the work has been carried out, hundreds of points of special concern and expense in the past have been eliminated. Slides and the sloughing off of cut slopes have stopped or have been greatly reduced; wet, soft track, with consequent heaving during the winter, has given way to a dry stable roadbed; rail batter, joint maintenance and general lining and surfacing work have been minimized; and slow orders on many formerly troublesome territories have been practically eliminated.

Because of many contributing and conflicting influences, it is difficult to appraise definitely the savings from these varying factors, brought about by improved track



Installing Eight-Inch Perforated, Corrugated Pipe in the Intertrack Space at Lima, Ohio, to Dry Up a Stubborn Wet Condition

drainage. It is of interest to note, however, that for the last three years, immediately following the most extensive drainage work, total expenditures for track laying and surfacing on the road have been only approximately one-third of what they were in 1928 and 1929, a reduction of approximately \$14,000,000 a year.

The extensive drainage work which has been done on the different regions of the Pennsylvania has been carried out under the general direction of Robert Faries, assistant chief engineer, maintenance, of the system, and under the immediate supervision of the maintenance of way officers of the different regions and divisions.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended October 26 totaled 707,826 cars, a decrease of 25,121 cars as compared with the week before but an increase of 83,018 cars, or 13.3 per cent, as compared with the corresponding week of last year. This was also an increase of 65,403 cars, or 10.2 per cent, as compared with 1933. All districts and all commodity classifications except live stock showed increases as compared with last year and loading of grain and grain products showed an increase over the preceding week. Miscellaneous freight showed an increase of 41,255 cars as compared with the corresponding week of last year. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, October 26

Districts	1935	1934	1933
Eastern	147,065	131,383	139,206
Allegheny	131,869	114,866	119,527
Pocahontas	52,638	44,370	45,132
Southern	97,850	88,653	89,425
Northwestern	106,722	84,498	83,386
Central Western	113,675	105,476	110,471
Southwestern	58,007	55,562	55,276
Total Western Districts.....	278,404	245,536	249,133
Total All Roads.....	707,826	624,808	642,423
Commodities			
Grain and Grain Products.....	37,451	32,164	30,157
Live Stock	21,289	25,543	22,146
Coal	128,692	119,753	132,382
Coke	6,691	4,943	6,408
Forest Products	30,675	21,923	24,174
Ore	31,461	14,655	19,917
Merchandise L.C.L.	166,189	161,704	171,733
Miscellaneous	285,378	244,123	235,506
October 26	707,826	624,808	642,423
October 19	732,947	640,727	657,005
October 12	734,274	636,999	670,680
October 5	706,877	632,406	662,373
September 28	630,771	646,084	669,186

Cumulative Total, 43 Weeks..... 26,020,342 25,897,392 24,247,161

Car Loading in Canada

Car loadings in Canada for the week ended October 26 totaled 52,807, as against 56,285 for the previous week and 55,402 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
October 26, 1935.....	52,807	21,806
October 19, 1935.....	56,285	22,736
October 12, 1935.....	58,571	22,049
October 27, 1934.....	55,402	19,748
Cumulative Totals for Canada:		
October 26, 1935.....	1,942,775	913,328
October 27, 1934.....	1,916,095	926,003
October 28, 1933.....	1,656,128	790,946

R. B. A. Holds Annual Meeting

Re-elects officers—Adopts resolution favoring constructive railway policy—Holds largest dinner in recent years

MORE than 1,700 executive officers of leading railway and railway supply companies attended the twenty-seventh annual dinner of the Railway Business Association at the Hotel Stevens, Chicago, on November 7. This was the largest gathering of its character in recent years and with one exception, the largest in the history of this organization. At this dinner Dr. W. T. Jackman, professor of political science of the University of Toronto, was the principal speaker.

At the annual luncheon and meeting of members of the association, which was attended by representatives of 351 member companies, President Harry A. Wheeler reviewed the activities of the organization informally, following which resolutions dealing with the railway situation were adopted and all officers re-elected. These officers include the following: President, Harry A. Wheeler; vice-presidents, William C. Dickerman, president of the American Locomotive Company, New York; William B. Given, Jr., president of the American Brake Shoe & Foundry Company, New York; George H. Houston, president of the Baldwin Locomotive Works, Philadelphia, Pa.; George W. Struble, vice-president of the Bethlehem Steel Company, Bethlehem, Pa.; and George E. Scott, president of the American Steel Foundries, Chicago.

The resolutions passed advocated the continuance of private ownership of railroads, favored regulation with a definite limitation as to the character of regulation, approved the regulation of competitive forms of transportation and, if such regulation cannot be made comparable with that applied to railroads, that railroad regulation be relaxed; and if the principles upon which public expenditures are applied to various private enterprises are just and equitable, that comparable aid be given the railroads in the form of lower taxes and a lessening of other burdens placed upon them by local and federal governments.

An abstract of Dr. Jackman's address follows:

Present and Future Problems of Railroad Economy

By W. T. Jackman*

We are living in an age of miracles. Modern science attests this fact. There is no other phase of economic life which shows greater miracles than the realm of transportation. Twenty years ago we were inclined to believe that we had reached the zenith—the acme of perfection—in transportation facilities. But today, railway men have been compelled to face an entirely new set of issues, introduced with the development of the motor vehicle, the airplane and the pipe lines, the building of waterways through the country, the new emphasis upon speed, and the changed commercial mechanism within which business is done on a hand-to-mouth basis.

One of the greatest issues before the railways is the competition of the motor vehicle. Doubtless, the automobile is destined to hold a large part of the passenger business, especially for distances up to 400 or 500 miles, while, on account of the newness of the motor bus, its cheapness of fares and the opportunity afforded its passengers to see the attractive sections of

the country, it has certain features which appeal to many who cannot provide themselves with the more expensive automobiles. But for the longer journeys, and when travelers desire not only speed but comfort, together with accommodation akin to that of the most modern hotel, nothing can take the place of the air-conditioned, streamlined passenger train.

It is the competition and the destructive methods of the motor trucks, however, that have produced the most unfortunate results. These trucks have multiplied upon the highways until they have become a menace to themselves and the public, as well as a disorganizing element in the business community. It is recognized that the facilities for highway carriage constitute a type of service which may be of real benefit to the business community, in providing sometimes greater speed and flexibility in the movement of traffic with less cost for packing, crating and drayage.

Railways the Fundamental Factor

In all countries it is acknowledged that the railway is the fundamental factor in the transportation system, and since the motor truck is found to be a means of providing desirable facilities, especially as to flexibility of movement, its service may be of additional advantage to the business community. We cannot expect, however, that all the present transport facilities can survive. The question then is to determine what relation the motor truck should have to the railroad in order to obtain the utmost public benefit. To answer this question some very careful investigations have been undertaken and it will be agreed that the general principles which should be observed in this connection are: (1) That each system of transport should be devoted only to that service for which it is best adapted, and (2) that insistence on active competition between the various transport agencies is not suited to present economic conditions.

If, under present circumstances, the motor truck—which is encouraged by inadequate payments for its roadway and for taxes—can carry a substantial portion of the lighter l.c.l. traffic for short distances in less time than the railway, the motor truck, whether independent or affiliated with the railway, will be used for this service. On the other hand, the railway has advantages for long-distance and mass transportation which the motor truck does not have. The maximum economical haul of the motor truck varies with different physical conditions and the actual facts should be ascertained by a cost analysis, but among those bodies which have made a detailed examination of this matter there is a well authenticated decision that the maximum length of haul of the motor truck should not exceed 125 miles.

These facts point to the desirability of using the motor truck in co-ordination with and tributary to the railroad. Since the motor vehicles operate largely between the same centers of traffic as the railways, and since a great proportion of the motor carriers are obtaining but a meager existence, we suggest as the logical solution that a traffic survey be made of the important traffic routes, with the object of finding how many common and contract motor carriers are necessary, along with the railroads, to furnish the requisite service. On this basis, the number of motor trucks could be determined, and all others should be excluded from each of these routes. This system would contribute to a ready co-ordination of railway and motor truck.

Further Diversion to Trucks Not in National Interest

Perhaps we may be allowed here to quote from the report of the recent British Royal Commission which made a complete study of the transport conditions there. It said, "We are very definitely of the opinion that it is not in the national interest to encourage further diversion of heavy goods traffic from the railways to the roads," for the reason that it would add greatly to the expenditure on highways and would tend to make the railways unremunerative, without conferring any commensurate

* Professor, Department of Political Science, University of Toronto.

advantage. Further, it said: "In our view the true function of road transport in . . . a co-ordinated system is auxiliary and complementary to the steam railways." The Royal Commission on Railways and Transportation in Canada, after a protracted study of all these issues for almost a year, stated that "in Canada, where of necessity freight must be conveyed in large quantities over long distances at all times of the year, railway transportation is essential to the economic welfare of the country. Because the railways are essential and because the railway freight rate structure implies conditions approximating to a quasimonopoly, the railways require, if they are to continue to operate efficiently, a measure of protection from long distance road competition and an equalization of the conditions under which short distance traffic is carried."

We emphasize the desirability, and we might say the necessity, of preventing further diversion of traffic from the railroads to the roads. It is the essence of folly to allow two different systems of carriage along the same route. Many present facilities of transportation are without economic justification.

The results of recent years have shown conclusively that both services cannot be sustained. If the better-paying traffic goes to the motor trucks, and the railways sought to charge on low-grade and raw materials rates which would yield adequate revenue to the rail carriers, the volume of outcry against these rates would be heard from every form of enterprise across the continent. Because there is a large amount of long-distance and heavy traffic, chiefly raw materials of industry and other basic products of manufacture and consumption, it is apparent that the railway is and will long remain the essential and economical means of transportation. Besides, it is very evident that the railway is the only year-round dependable means of transport.

Suggested Conference With Traffic Leagues and Managements of Shipping Industries

What then, may we suggest, is the course most consistent with economy? In the first place, on account of the mutual interdependence of the railroads and the shippers—the one equally dependent upon the other—the railroads should show the shippers clearly what the outcome of the present course will be. We are confident that if shippers realized that their present system of shipping large amounts of their high class products by motor vehicle were sure to lead to inability of the railroads to continue their service, they would change their methods of shipment and transfer their allegiance to the railroads. To the shippers the cheaper rates and more flexible service of the motor carrier have a strong temporary appeal. But the industrial concerns, most of which have been built up as a result of favorable railway service and rates, are not unmindful of the fact that, if railway service should be discontinued as a result of financial disaster, their industrial position would be subjected to corresponding disaster. It is, highly important therefore, that the Association of American Railroads and the Railway Business Association should get up a succinct and clear statement of the railroads' financial condition and then go into conference with the industrial traffic leagues and the managements of the companies whom these traffic men represent.

It is frequently useless to discuss such issues solely with traffic men individually, for their purpose is to run their departments in the most economical manner possible. But if the traffic men and the managements of their companies could see that the outcome of the present course were to so deplete railway revenues as to render the railways incapable of carrying on, the course of wisdom would find its outlet by turning the traffic to the railways, especially if the railways could furnish reasonable auxiliary highway service when this was desired. To rely upon governmental regulation—which has recently been entrusted also with control of motor vehicles—as a means of adjusting two agencies to their proper spheres, is to lean upon a broken reed. The Federal Co-ordinator has acknowledged that the best results could be obtained if negotiations were carried out by the interests concerned, and we can see no more effective instrument for securing a satisfactory solution than an open conference conducted on a basis of actual realities which all interests must face.

"Railroad Voice" Is Pretty Feeble

In the second place, the future of the railroads demands that operating as well as overhead costs be reduced to the lowest

margin. There has been among the railroads too strong a tendency to act upon their own individual initiative and to think of their own individual welfare without regard to others. The school of individualism has produced men of keen business acumen, but the day when competition was "the life of trade" has been succeeded by a day when, in many cases, competition is the death of trade. One of the primary purposes of the Association of American Railroads should be to integrate all the railroads into such a strong organization that its voice would be a united force for the national welfare. It has been very patent that in the case of some bills introduced in Congress, such as the railroad retirement bill, the Guffey coal bill, the government ownership bill, etc., the railroad voice, if heard at all, was not very pronounced. When other interests are strongly represented, and the railroads individually give an uncertain response to such measures, the inevitable will happen in the subjection of the weaker claim. Do the railroads realize that in many respects they must persist, advance or recede together? If so, the present is the time for all joining together with a strong common purpose of promoting the public welfare, and consequently their own welfare.

But it is not in this alone that competition should be eliminated. Collective action would enable the roads to reduce materially a large range of costs. The mere fact that a railroad system has been built up as a separate entity is no reason why it should remain an independent organization for all time to come.

May we refer here to the fact that, in Great Britain, the railways which formerly crossed and re-crossed, which invaded each others' territories haphazardly, and were like tangled threads woven in a fabric without design, have been organized into four virtually non-competing groups, to the advantage of the public and of the railway companies? If this result could be brought about in the case of over one hundred companies, many of them with a strong antipathy to joining their interests with others, surely the development of an extended system of collaboration here, where the conditions point toward that goal, should not be so difficult to effect.

No Time Like the Present for Unification

The inimical effect of having several railroads engaged in an intense rivalry to obtain traffic is very patent in this period of depression, and there is no time more appropriate than the present for effecting unification of railway interests and reduction of railway costs. In our view, this can be done most appropriately by the railways undertaking to provide collaborative highway facilities, working together to reduce costs of service as well as overhead expenses, and by taking the initiative in bringing about railroad consolidations. Much better results may be obtained by having these problems solved by the railroads on the basis of operating economies than by leaving the remedies to be devised by a governmental agency. Here is a most fruitful field for these two associations to render a very conspicuous and valuable national service.

In the elimination of competitive wastes, it is inevitable that many portions of railway lines should be abandoned. In their endeavor to get rid of such burdens, opposition is encountered in some cases from the War department, which, in view of possible future war, is desirous of keeping open all available routes for the transportation of munitions and supplies. If the railroad must retain these portions of line which are unprofitable, the War department, if it wishes them continued, should be ready to pay the expense of their maintenance.

Public Relations Work Needs to Be Intensified

We come now to certain intangible factors facing the railway world today, and we do not hesitate to say that the intangible are usually the most potent factors. Among these intangible factors we would mention two which have a very intimate relation to the present and future problems of railway economy, namely, the force of public sentiment and the agitation for government ownership.

Concerning the former, since the railway is so vital a part of the business and social interests of the community—a private utility entrusted with a public interest—the attitude of the community is a very significant factor in the railways' welfare. On account of the intimate connection of the railways with all the significant phases of economic and social well-being, should not some very definite means be continuously employed to educate the masses of the people as to their dependence upon the railway

for their community's welfare? When erroneous or misleading statements are made in the press or the public forum against the railways, multitudes are ready to believe them, because they know no better; and the force of public opinion gathers momentum—to the railways', and consequently the community's, detriment. May we suggest the desirability of meeting these conditions publicly? How?

1. By having some person in each section of the country who would be familiar with what was being said and written, and who would correct at once any erroneous statements before they attain any prominence.

2. By the publication of frequent clear and brief statements, as press releases—so interesting that all will want to read them and so simple as to be readily understood—showing the work accomplished by and the manifold contributions of the railways to the national welfare.

Government Ownership a Real Danger

In regard to the second intangible element noted here, namely, the propaganda for government ownership, let us realize that this is a vital subject. There are some today who are making light of this possibility, but I should like to say that when the Federal Co-ordinator has expressed his approval of it, when the American Federation of Labor has expressed its adherence to this policy, when the chairman of an important committee of the United States Senate and his cohorts have a bill for giving effect to this system, and when many agricultural conferences have passed resolutions favoring it, we have clear indications that this is a matter of real solicitude.

Economic issues, especially when allowed to drift, have a habit of coming to a crisis very quickly. The government has been establishing itself in the realm that is appropriate to private business and is now there on a great scale—for instance, note the T.V.A., the Boulder dam, the Mississippi Barge line, the development of the Ohio and Missouri river navigations, attempts to undertake the St. Lawrence Waterway, etc. Political influences have been used to induce the government to listen to the requests of the A. F. of L., of many railroad labor organizations, of socialistic and communistic bodies, of the forces underlying the White House administration. Unless definite action is taken to preserve the principle of private ownership, we may be stirred out of our complacency very quickly some day in the near future to find that the railroads have been taken over by the government "to save their credit," or "to operate them for the public welfare instead of for Wall street," etc.

If this should take place, the evils which would inevitably accrue would astonish even many pronounced government ownership advocates—the taxes to be paid, the increased numbers of political satellites employed, the extension of facilities beyond any possibility of remuneration, the bureaucracy of management and regulation, the pouring out of the people's taxes to assure votes—but why follow the sordid story! It must be remembered that we are speaking here from actual knowledge.

How shall we avoid this? Fundamentally, it is a question of the voters' demand. Our representatives in government act according as they think the voters wish, for every one of them seems to be keenly anxious to maintain his place as the people's representative in the government.

Politics Are Made "Back Home"

The business of government is politics, and the politics are made back home. So it is a question of educating the voters, whose votes determine what the government will do—educating them as to the basic facts underlying government ownership, its supposed advantages and its manifold defects. How shall we educate the voters as a whole? I suggest the following course:

1. Have a study made of the subject by unbiased men of good judgment. For this study, it is suggested that the majority of the men should be transportation specialists in our important universities, and the chairman of the group might very appropriately be chosen as a non-partisan man outside of academic ranks, but one who, like the others, would command the unalloyed confidence of the public.

2. The results of this study should be outlined in clear and brief form, and should be widely published in the press of the country, so that all might have an opportunity of learning the fundamental realities of the issue. In addition, it would probably be desirable to use the radio, and to be ready in public

meetings to answer the people's questions, objections and problems in the same open and unbiased way.

3. No government would be able to withstand the force of public opinion formed by such competent and unprejudiced authority; and no body or class of men would attempt to meet the arguments of such a capable and impartial analysis by such a judicious group of experts.

The great issue before the country now is: Shall we have governmental policies which will rigidly restrict production, or shall we have such governmental policy and encouragement of business enterprise as will increase production? Production is the only source of wealth. In this production of wealth, railway enterprise and initiative, if given reasonable scope and encouragement, would be of paramount importance.

What the railroads need most of all is traffic. But traffic cannot move without markets for our products; and our agriculture and industry cannot be prosperous without markets in which to sell their surplus products. Moreover our surplus products cannot be consumed at home—we cannot be economically self contained. We must have international trade. But trade between countries is not possible unless there are helpful conditions to contribute thereto. We cannot expect to restore trade and get back to normal, reasonable conditions until there have been restored the conditions and confidence and harmony which are the essential factors underlying trade between nationals. The first consideration of our governments should be to establish harmonious international relations. What have they done since 1918 to bring about these amicable relations? This, not public works programs and relief, is the basis of economic development and human welfare.

A. A. R. Annual Meeting

THE first annual meeting of the Association of American Railroads, which was formed a year ago by a consolidation of various railroad activities, was held on November 7 and 8 at Chicago. The proceedings included a review of the Association's activities of the past year and a consideration of its program for the coming twelve months. Joseph B. Eastman, federal co-ordinator of transportation, spoke on terminal co-ordination, urging the railroads to take immediate action.

* * *



The Chesapeake & Ohio's "George Washington" Arriving at Cincinnati, Ohio



The Efficiency (Net to Tare Ratio) of These Little Cars in L.c.I. Service is 2.4 Times That of the American Box Car

British Railways Attain High Efficiency in L.c.I. Handling

Small "goods wagon" an ideal vehicle for this traffic—C. and D. trucks a powerful advertising medium

By J. G. Lyne

THE American observer of the British railways comes inevitably to the conclusion that those railways have been far more successful in meeting highway competition than have the railways on this side of the Atlantic. Indeed, competition, while it is keen enough to keep the railways constantly on their toes, so to speak, is no longer making such inroads into railway traffic as it formerly did. Rather the railways appear to be gaining ground in recapturing traffic formerly handled by highway. The success of the British railways in this regard is all the more remarkable because the country is one of short distances and the average haul of freight—56 miles—is well within a zone in which, in the United States, the truck has taken the bulk of the traffic.

Trucks in Britain Really Pay Some Taxes!

Several factors have aided the British railways in surmounting this handicap. In the first place, trucks there do not escape with the absurdly inadequate payments for the use of the highways which is a characteristic of their operation in most American states. For instance the annual license fee on a truck weighing unladen between 5 and 6 long tons is \$600. In addition, the gasoline duty is 8d. per imperial gallon (about 13 cents per U. S. gallon and *all of the gasoline tax is*

used for general expenses of government and is not, as with us, devoted to the improvement of highways.) England has many fine arterial highways, but has attained nothing like the prevalence of such roads that we have with our profligate expenditure of tax funds. The consequence is that highways between many important centers are, relatively to American conditions, narrow and congested, which increases the cost of truck operation and slows it up.

Furthermore, while there is no regulation of truck rates, there is a requirement for what in America would be called a "certificate of convenience and necessity" from the regulatory authorities which tends to prevent undue expansion of truck operations by restricting the number of operators and vehicles somewhat in proportion to the actual demand for their services. And the railways, to meet truck competition, are permitted to make exceptions from published rates. But, more important perhaps than any of these factors in retaining and regaining traffic on the railways, has been the efficiency and speed with which the railways handle the traffic, their comprehensive service (including both collection and delivery and warehousing, at low rates), the simple packing requirements (which are no more onerous for railway shipment than for that by highway,

Each of the More Than 36,000 Highway Vehicles Operated by the British Railways is a Moving Advertisement of Railway Service



when containers are used, and are comparatively generous for ordinary l.c.l. handling) and the extensive advertising and merchandising efforts of the railways. These latter have resulted in a public which is definitely "railroad-minded" and in a staff of railway employees who, regardless of occupation, are by and large bending every effort to increase the public use of the service which provides them their livelihood.

Why Costs Are Low

Handling costs are kept relatively low by wage rates which are much lower (as living costs are also lower) than in the United States, and the fact that a train crew consists of only three men—an engineman, a fireman and one trainman, instead of five men as with us. A 50-car train of l.c.l. merchandise will contain approximately 82 per cent as many pounds of pay load as a 50-car train with us. Since the gross load is much less (due to smaller and lighter cars), both fuel consumption

and wage costs per net ton-mile of l.c.l. traffic would apparently average much lower than in America.

The bulk of the l.c.l. business done at any freight station, of course, is with regular customers, that is, shippers who use the service almost every day. The railway's collection service is zoned, and the truck drivers each have their own set of regular patrons with whom they deal. As occasional shippers notify the railway by phone or mail of shipments to be called for, these orders are allocated among the drivers assigned to each zone. So each truck driver starts his collection route with a definite number of regular patrons to call upon, and a list of occasional shippers supplied him for the day.

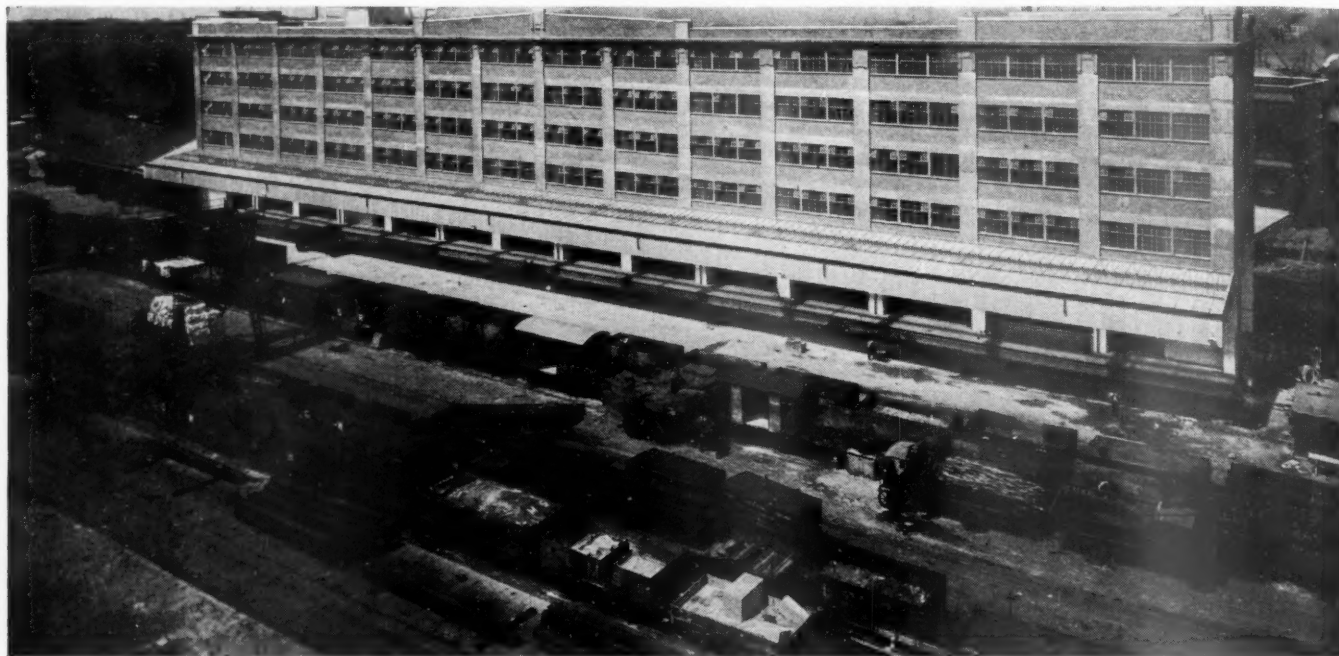
Naturally the bulk of the inbound (delivery) work is done in the morning and the bulk of the outbound (collection) in the afternoon. However, there will be some pick-up work that the driver can do even when he is returning from making his first delivery trip in the



A "Goods" Train on the Great Western

morning and some deliveries which he can make in the afternoon. The more of this which can be done, of course, the less the truck-empty mileage. Since every truck entering or leaving the station passes over a weigh-

ment on the platform. Usually the shipper's weight on the consignment note is accepted (a check on the correctness of these is provided by the fact that the total of the weights shown on consignment notes brought in by a



Team Tracks and Warehouse at G. W. R. South Lambeth (London) Freight Station

bridge and since drivers are paid a bonus according to tonnage handled, they share with the company the economies of loaded movement in both directions. (Each driver, incidentally, has a helper—a youth, usually not on the permanent payroll, but who shares in the bonus for handling tonnage above the minimum).

Checking and Billing Procedure Is Simple

In making deliveries, drivers are supplied with "delivery sheets"—one covering each shipment, giving name and address of consignee; and information as to whether or not the carrying charges are to be collected. If they are to be collected, the driver collects them. But the British railways do business on a 30-day basis with regular patrons who have established their credit and collection of freight charges is not one of the truck driver's greatest concerns.

The railways do not require bills of lading from shippers—an informal "consignment note" authorizing the railway to transport a given shipment, giving the name and address of shipper and consignee, the nature of the shipment (and usually its weight) is all that is required. The truck comes in to the station yard, is weighed and the net tonnage credited to the driver. The "consignment notes" are handed to the platform foreman who distributes them among the platform truck gangs. (At the G. W. R. South Lambeth station in London, because of surrounding physical conditions all platform trucking is done by hand, and the gang unit consists of a checker, a caller-off and two truckers. Where conditions permit the economical use of mechanical trucks, the make-up of a gang will vary accordingly. But, in all cases, the tonnage loaded and unloaded by each gang is accounted for, and a bonus is pro-rated among all who belong to the gang if its performance is above the set standard. Hence the checker and the caller-off usually contribute as much effort as they can spare to the actual physical handling of the freight).

It is not the practice to weigh each individual ship-

ment on the platform. Usually the shipper's weight on the consignment note is accepted (a check on the correctness of these is provided by the fact that the total of the weights shown on consignment notes brought in by a

Packing Requirements Are Not Severe

As cars are loaded, skilled stowers rearrange the shipments to obviate loss and damage in handling. The ability of these stowers and the mechanical excellence of the British 4-wheel car for merchandise handling is shown by the simplicity of the packing requirements. Ordinary hand baggage is accepted for shipment in l.c.l. freight service. Similarly catsup and bottled beverages in open-top cardboard cartons were observed in the lading of ordinary l.c.l. merchandise cars, and bicycles and motorcycles, galvanized pails, and plywood were all observed without any crating. To the casual observer the crating and packing required for shipment on the British railways would not appear to be much more elaborate than that required for handling by highway.

As cars are loaded the consignment sheets go into the billing room where rate clerks note the charges on them and pass them on to the billing clerks who make out the waybills. If the waybills are completed in time they go forward with the car (actually clipped into a receptacle on the side of the car and not in charge of the train crew). If billing cannot be completed before the cars are moved, the bills are sent out by passenger train. Wherever possible the bill clerks make out not only the waybills but, by the use of a carbon, the "delivery sheets" as well for the destination point.

At a typical station (on the Great Western at South Lambeth, London), the first cars—for the more distant stations—must be ready to move at 7:15 p.m. A switch engine pulls them out and they are quickly made into a train for movement to Old Oak Common outside London, where trains from the different London stations are consolidated into through trains for main line movement to destination. By 10 p.m. the last of the cars are loaded and despatched, and the billing force completes its task by 11 p.m.

Inbound cars start to arrive about 5 a.m. and are spotted by the switch engines. The platform gang comes on duty at 7 a.m. and proceeds with the unloading. There is a spot on the tail board platform assigned to each delivery zone and to that spot all shipments for that zone are brought by the platform gangs. Truck loading gangs load the trucks and, when the drivers come on duty they are given the delivery sheets covering the shipments loaded in their trucks, and begin the outbound movement without delay. South Lambeth station employs two shifts of platform truckmen. Hours worked weekly are 48—or something over 8 hours a day for 5 days, with Saturday a short day and Sundays off. Outbound traffic is accepted from shippers who do their own cartage up to 5 p.m. The company's own collection trucks, however, keep arriving until well past 6 p.m. and even later. And all the freight is given next morning delivery to points 300 miles or more away.

"Goods Wagon" More Efficient Than Box Car

A really large freight station on the Great Western—that at Bristol Temple Meads—on a typical day recently handled 493 cars in and 550 cars out, over the platform, in addition to 30 cars in and 120 out handled on team tracks. This station loads cars daily for approximately 300 destinations. At this station most of the platform trucking is done mechanically by gasoline tractors the operation of which is very rapid. Through loading to

car was 3.63 tons. With a 40,000 lb. capacity box car weighing 23 tons, it will be seen that the net to tare load factor of the standard box car in l.c.l. service is only 15.8 per cent in the United States as compared with 38 per cent attained with the diminutive British "goods wagon."

Stated in another way, at the average load per "goods wagon" given above, 100 tons of revenue freight would require 33.7 "wagons". In America, according to the Co-ordinator's report, the same volume of freight would require 27.5 box cars. With "goods wagons" weighing 7.78 tons unladen and box cars 23 tons, it is apparent that to haul 100 tons of l.c.l. revenue freight the Great Western will have to move only 262.3 tons of dead weight, whereas the American railways will, on the average, have to haul 632.5 tons of dead weight. It is evident, therefore, that for l.c.l. traffic the "goods wagon" is 2.4 times as efficient as a box car.

The fact that the British railways are consolidated into only four systems also has reduced the number of originating carriers and has permitted the great volume of traffic to be handled without transfer from station of origin to destination. At Bristol Temple Meads, as before stated, 90 per cent of the shipments are loaded through to destination, and only 10 per cent to transfer points—whereas the Co-ordinator's merchandise traffic report shows that the number of times the average ton of l.c.l. freight is transferred from car to car from



G. W. R. Freight Station at Wolverhampton (Cartage Platform at Left)

destination is possible for about 90 per cent of the traffic, only about 10 per cent having to be consigned to transshipping points. An average load of 5,936 lb. is attained in l.c.l. loading.

The typical box car of 12 long tons' capacity, into which most of this traffic is loaded, weighs unladen 15,568 lb., giving a load factor of net to tare of 38 per cent. In the United States according to the Co-ordinator's merchandise traffic survey, the average net load per l.c.l.

origin to destination is 1.03. With our many railways, probably nothing like the percentage of through loading in l.c.l. service could be obtained, as has been done in Britain, short of pooling on a considerable scale.

Railway Cartage Inevitably More Economical Than Shippers'

The Great Western, in common with the other British railways, operates its own cartage services. These serv-

ices are not expected to earn much net revenue; it being generally agreed, however, that they ought to be made to pay their own way as nearly as possible. (The rate structure is divided into a portion for line haul and a portion for collection and delivery, but, generally speaking, the allowance to the shipper or consignee who does his own trucking is not sufficiently large to prove much of a temptation.) The railways much prefer to handle all collection and delivery of merchandise freight with their own vehicles and the rates they offer to bring this about are justified by the saving in space over that which would be necessary if accommodation had to be provided for innumerable vehicles belonging to, or contracted for by, shippers and receivers of freight. Railway truck service is more efficient, because it maximizes both inbound and outbound truck loading. It reduces congestion at the truck loading and unloading platforms, and simplifies handling by platform gangs. Congestion and delay in truck operations around stations is completely eliminated, which is impossible where the truck operations are not under railway control; and delay from traffic congestion around freight houses must be avoided to keep down handling costs and hold traffic on the rails.

Railway C. and D. Reduces Street Congestion

Moreover, there is a decided social advantage in having collection and delivery service zoned and performed by few operators, because this handling reduces street congestion to a minimum—when compared with the wasteful practice of having collection and delivery performed by a multiplicity of small operators, each of

same way that the Railway Express Agency does in this country (also, in some cases, displaying the posters of various manufacturers which service provides an additional source of revenue). With possibly as many as half of the freight vehicles (aside from merchants' delivery trucks) which one sees on the streets of an English city being those operated by railways, the tremendous publicity power of these "moving sign boards" is apparent. Collection and delivery service thus provides a powerful publicity medium and a source of personal contact with shippers which, while not ordinarily enumerated among its advantages, are really perhaps the most important contribution of this service to the solution of the railways' competitive problem.

Low Cost Warehousing an Inducement to Ship by Rail

Aside from collection and delivery service, a rate structure much simpler than our own and regulated highway competition which is not permitted to overwork its employees, the British railways have found that their warehouse service has also been of great assistance in retaining and regaining traffic. Almost every important railway freight station is also a warehouse, with rates made very moderate for patrons who use railway service in and out on shipments warehoused. Goods may be sent in carload lots and delivered by the railway in small units, under the direction of the shipper, as orders come in. Some of the largest manufacturers in Great Britain avail themselves of this service. No British manufacturer has to operate his own trucks or have any dealings with independent warehouses to conduct his business. The railway companies will undertake the whole transport and warehousing job. Warehousing is done in



Railways Truck All Classes of Traffic to and from Remote Farm Areas, Making Unnecessary the Ownership of Freight Vehicles by Farmers

whom holds himself out to serve an entire city. Finally, collection and delivery service by the railway means direct personal daily contact between the shipper and consignee and a man directly on the railway payroll who has a personal financial interest (because of the weight bonus) in keeping the customers satisfied with railway service.

To the American observer there appears also to be a huge publicity advantage in having a railway company's vehicles moving about the city streets. Each of these vehicles is a medium for advertising the railway and keeping it constantly in the public eye. The railway truck with the company's name on it alone is a worthwhile advertisement, but the railways have gone farther and are using their vehicles for poster advertising in the

small quantities at a certain rate per ton—or by the square yard at 5s.3d. (approximately \$1.30) per year.

Not only has general traffic been in a large degree retained on the railways by the methods outlined herein, but the class of traffic—household removals—which at one time had been all but completely lost to the rails, is being rapidly regained by the use of containers. One sees advertisements everywhere for this railway service "estimates furnished free." The railways have made arrangements with local moving men whereby the latter estimate on costs of packing and unpacking household effects. The railway adds this charge to the railway rate and makes a lump sum quotation to the prospective shipper for the entire service from the old dwelling to the new. As an added inducement, low passenger rates are offered for the entire family to their new home, provided their goods are shipped via railway container. A lucrative and continuous traffic, once all but entirely gone, is thus being won back to the rails.

Santa Fe's New Diesel Makes Record Run

(Continued from page 597)

cylinder terminate in this muffler which vents to the outside through four stub riser pipes welded in the top. This muffler is designed to prevent the pocketing of fumes and also to reduce exhaust noise to a minimum.

In the center of each unit is a group of three auxiliaries all driven by a 6-cyl., 90-hp. Diesel engine. The auxiliaries are the air compressor, battery-charging generator, and traction-motor blower fan.

The Winton air compressor is a 4-cyl., 2-stage, water-cooled unit, with a displacement of 158 cu. ft. per minute. This supply of air is continuous regardless of car speed, as the auxiliary engine speed is constant. The compressor is equipped with governors which control an unloader on the compressor to maintain the required pressure in the air reservoirs.

A 10-kw. generator is supplied to charge the storage battery. This generator, with its control, provides a constant potential battery charging sufficient for all conditions under which this equipment is used.

The third unit of this auxiliary group is a centrifugal blower fan which supplies air to the traction motors via the air ducts provided in the underframe.

The Electrical Transmission and Control System

An independent electrical transmission, furnished by the General Electric Company, is provided to deliver power from each engine to the two driving axles immediately below that engine. Each transmission equipment consists essentially of a generator, two traction motors, and control contactors for connecting the motors to the generator in the proper sequence, and for reversing the direction of motion. There are no mechanical or electrical connections between the two power plants other than an electric throttle and controller which controls both from either end of the locomotive.

Each engine is directly connected through a flexible coupling to a direct-current generator, especially designed to provide characteristics most suitable for this particular engine. Each has sufficient capacity to transmit continuously to the traction motors the rated output of the engine for which this equipment is offered. The exciter for each generator is mounted on the extension of the generator shaft and is used solely for excitation purposes.

Four traction motors of the G. E. railway series type are provided, two mounted on each truck. Each traction motor is geared to a pair of driving wheels and supported by a spring nose suspension to protect it against undue strain.

The multiple-unit control system used on this locomotive has been so designed that any number of units may be coupled together and be controlled from one operator's station. This provides a great range of flexibility for this type of locomotive, as units can be added when traffic conditions require additional power.

The entire control system centers around a trunk line extending from one end of the locomotive to the other and terminating at each end in a plug socket from which a jumper may be used to carry the trunk lines to the next locomotive if more than one locomotive is to be used. The various lines in this trunk feed contactors which control the different pieces of apparatus in the locomotive. This trunk line operates on battery voltage. As the high-voltage contactors are directly over the generator, this provides a minimum of high-current-carrying wire.

A control station, provided in each cab, is equipped with a master controller, reverse lever, throttle lever, brake valves, sander valve, control switches, and instrument panel, so grouped around the operator's seat as to give the greatest ease of operation.

The controller lever has three running positions for controlling the motor grouping to provide the maximum tractive force at all speeds. The controller is also equipped with a reverse lever to regulate the direction of travel. The throttle is equipped with eight running positions in addition to an idle position. Through electro-pneumatic linkage, it operates a Woodward variable-speed engine governor which in turn controls the engine speed.

The No. 8-EL brake and sander valves are similar to those used on steam locomotives. Switches for the positive battery control of engine starting, fuel pumps, and exciter field are located on the side of the throttle stand. The various light switches are in a box over the operator's side window. This gives the operator complete control of the locomotive at his station.

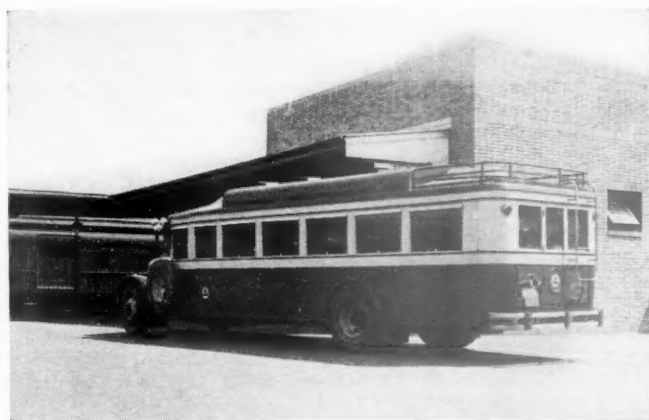
Each unit is completely equipped with instruments to check the operation of the various pieces of apparatus. At each control station is an instrument panel upon which are located the two air gages, speedometer, and warning lights for low oil supply. On each of the main engines is an instrument panel containing a tachometer, water thermometer, and fuel and lubricating-oil pressure gages. The auxiliary engine has a water thermometer, fuel and lubricating-oil pressure gages. Each engine also has connections for an exhaust pyrometer for measuring the temperature of the exhaust gases of each cylinder. The heating boiler has steam pressure and water level gages.

Double-end continuous train-control apparatus, furnished by the Union Switch & Signal Co., has the usual cab signals and is arranged not only to stop the train by means of brake application but to cut off the power from the engine in the event of a penalty stop.

The battery is an Exide 450-amp.-hr. unit, consisting of 32 cells. This battery supplies electric current for engine starting, control operation, and all auxiliaries, such as fuel pump, boiler motors and locomotive lights.

The locomotive is well equipped with warning signals. A standard 14-inch bell with automatic ringer is mounted on the roof. At each end of the locomotive is a Typhon air horn. These horns give loud penetrating blasts and are used in place of the steam whistle. An electric siren is provided to give still further warning in cases of emergency. The locomotive is equipped with standard air signal equipment.

* * *



At the Bus Station of the Pennsylvania-Reading Seashore Lines' New Atlantic City (N. J.) Terminal

NEWS

Class I Railroads Show Increased Net for Sept.

But the nine-months' total is 6.6 per cent less than that for same period last year

Class I railroads for the first nine months of 1935 had a net railway operating income of \$321,994,682 which was at the annual rate of return of 1.70 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics of the Association of American Railroads. In the first nine

11.4 per cent. Operating expenses totaled \$218,040,299, compared with \$203,220,059 in the same month in 1934, or an increase of 7.3 per cent.

Class I railroads in the Eastern district for the nine months had a net of \$211,326,243, at the rate of 2.32 per cent. For the same period in 1934, their net was \$206,341,752, or 2.26 per cent. Operating revenues in the Eastern district for nine months totaled \$1,281,367,191, an increase of 1.8 per cent compared with 1934, while operating expenses totaled \$933,647,853, an increase of 2.6 per cent. Railroads in the Eastern district for September had a net of \$28,957,812, compared with \$20,600,579 in September, 1934.

CLASS I RAILROADS—UNITED STATES

Month of September

	1935	1934	Per Cent of Increase
Total operating revenues.....	\$306,960,214	\$275,539,656	11.4
Total operating expenses.....	218,040,299	203,220,059	7.3
Taxes	20,819,370	19,853,825	4.9
Net railway operating income.....	57,359,339	41,713,425	37.5
Operating ratio—per cent.....	71.03	73.75	
Rate of return on property investment—per cent.....	1.89	1.37	

Nine Months Ended September 30

Total operating revenues.....	\$2,511,921,427	\$2,464,173,008	1.9
Total operating expenses.....	1,916,671,363	1,835,085,595	4.4
Taxes	182,653,401	188,055,281	2.9*
Net railway operating income.....	321,994,682	344,585,784	6.6*
Operating ratio—per cent.....	76.30	74.47	
Rate of return on property investment—per cent.....	1.70	1.81	

* Decrease.

months of 1934, their net railway operating income was \$344,585,784 or 1.81 per cent. Operating revenues for the first nine months of 1935 totaled \$2,511,921,427, compared with \$2,464,173,008 for the same period in 1934, an increase of 1.9 per cent. Operating expenses amounted to \$1,916,671,363, compared with \$1,835,085,595 for the same period in 1934, an increase of 4.4 per cent.

Class I railroads in the first nine months of 1935 paid \$182,653,401 in taxes, compared with \$188,055,281 in the same period in 1934, or a reduction of 2.9 per cent. For the month of September alone, the tax bill mounted to \$20,819,370, an increase of \$965,545 or 4.9 per cent.

Thirty-one Class I railroads failed to earn expenses and taxes in the first nine months of 1935, of which 9 were in the Eastern district, 6 in the Southern and 16 in the Western district.

Class I railroads for September had a net of \$57,359,339, which was at the rate of 1.89 per cent. In September, 1934, their net was \$41,713,425 or 1.37 per cent. Operating revenues for September amounted to \$306,960,214, compared with \$275,539,656 in September, 1934, an increase of

Class I railroads in the Southern district for nine months had a net of \$35,649,815, at the rate of 1.52 per cent. For the same period in 1934, their net amounted to \$39,548,078, at the rate of 1.67 per cent. Operating revenues in the Southern district for nine months amounted to \$314,918,478, an increase of 2.8 per cent compared with the same period in 1934, while operating expenses totaled \$250,022,380 an increase of 5.9 per cent. Railroads in the Southern district for September had a net of \$5,978,785, compared with \$3,025,762 in September, 1934.

Class I railroads in the Western district for nine months had a net of \$75,018,624, at the rate of 1 per cent. For the same nine months in 1934, they had a net of \$98,695,954, at the rate of 1.30 per cent. Operating revenues in the Western district for nine months amounted to \$915,635,758, an increase of 1.9 per cent above the same period in 1934, while operating expenses totaled \$733,001,130, an increase of 6.4 per cent. For September, the railroads in the Western district reported a net of \$22,422,742, compared with \$18,087,084 for the same roads in September, 1934.

President Approves More Grade Crossing Programs

Up to November 2 contracts had been awarded to the amount of \$6,517,366

The President has approved a program submitted by the State Highway Commission of Arkansas involving \$1,955,100 of the funds previously apportioned by the Secretary of Agriculture to Arkansas for the elimination of hazards at grade crossings in that state. As the total apportionment to Arkansas under the \$200,000,000 Works Program allocation for grade crossings is \$3,574,060, there remains a balance of \$1,618,960 to be covered by later programs. The federal funds now allotted are to be applied to 18 projects on the federal-aid highway system outside of municipalities, involving the elimination of 7 railroad grade crossings by construction of 7 grade separation structures, the elimination of 17 railroad grade crossings by 10 highway relocation projects, and 1 highway planning project, at a total estimated cost of \$1,113,000; 5 projects within municipalities on extensions of the federal-aid system, involving the elimination of 4 railroad grade crossings by the construction of 4 grade separation structures and 1 relocation project, at a total estimated cost of \$410,000; 4 projects within municipalities not on extensions of the federal-aid system, involving the elimination of 5 railroad grade crossings by the construction of 4 grade separation structures, at a total estimated cost of \$205,500; and 4 projects on secondary or feeder roads outside of municipalities, involving the elimination of 4 railroad grade crossings by the construction of 4 grade separation structures, at a total estimated cost of \$226,600.

The President has also approved a program submitted by the State Department of Highways of Nevada involving \$402,000 of the funds previously apportioned. As the total apportionment to Nevada under the allocation for grade crossings is \$887,260, there remains a balance of \$485,260 to be covered by later programs. Four of the projects are on the federal-aid system outside of municipalities at a total cost of \$292,000, and two projects are on extensions of the system into and through municipalities at a total cost of \$110,000.

The President has also approved a program of \$4,710,000 for grade crossing elimination for Iowa. As the total apportionment to Iowa for grade crossings was \$5,600,679, there remains a balance of \$890,679 to be covered by later programs. The grade crossing elimination

allocations are to be applied to the following classes of projects:

Thirty-six projects on the federal-aid system outside of municipalities, involving the elimination of 26 grade crossings by the construction of 26 grade separation structures; the elimination of railroad grade crossings by 2 highway relocation projects; the reconstruction of 7 existing grade separation structures; and 1 planning project, at an estimated total cost of \$1,542,000; 23 projects within municipalities on extensions of the federal-aid system, at an estimated total cost of \$2,638,000; and 17 projects on secondary or feeder roads outside of municipalities at a total cost of \$530,000.

Up to November 2 plans for grade crossing projects in 38 states had been approved to the amount of \$18,280,000 and contracts had been awarded to the amount of \$6,517,366. The status of the grade crossing program up to November 2 is shown in a table compiled by the Bureau of Public Roads as follows:

Status of U. S. Works Program Grade Crossing Projects for Week Ending November 2.

State	Plans approved to date	Contracts awarded	
		During week	To date
Alabama	\$1,715,000		\$689,368
Arizona	50,000	\$39,901	39,901
Arkansas	384,000	51,000	149,000
California	794,000	25,993	25,993
Colorado	236,000		190,000
Connecticut			
Delaware			
Dist. of Colum.	167,000		
Florida	486,000		225,713
Georgia			
Hawaii			
Idaho	431,000		52,000
Illinois	490,000		
Indiana	1,762,000	425,033	425,033
Iowa	769,000	26,307	542,540
Kansas			
Kentucky	878,000	134,312	134,312
Louisiana			
Maine	79,000		
Maryland			
Massachusetts	256,000		
Michigan	1,851,000	156,107	1,267,356
Minnesota	74,000		
Mississippi	314,000		
Missouri	140,000		
Montana	695,000		176,000
Nebraska	603,000		326,086
Nevada	355,000	170,684	220,518
New Hampshire			
New Jersey			
New Mexico	143,000		41,000
New York	1,028,000	611,124	611,124
North Carolina	443,000	163,877	163,877
North Dakota	50,000		39,400
Ohio			
Oklahoma	665,000		310,000
Oregon	307,000		33,000
Pennsylvania	53,000		
Rhode Island	275,000	191,162	191,162
South Carolina	408,000		129,360
South Dakota	144,000	64,200	64,200
Tennessee	83,000		
Texas	352,000		59,000
Utah	162,000		26,000
Vermont	284,000		
Virginia			
Washington	702,000		41,000
West Virginia			
Wisconsin	592,000	179,000	295,000
Wyoming	60,000		49,423
Totals	\$18,280,000	\$2,238,700	\$6,517,366

Annual Meeting of N. I. T. League

The annual meeting of the National Industrial Traffic League will be held at the Palmer House, Chicago, on November 20-21. At a luncheon on November 20, Carl R. Gray, president of the Union Pacific, will speak on Developments in Transportation.

Railway Club of Pittsburgh Elects Officers

At the annual meeting of the Railway Club of Pittsburgh, which was held at the

Ft. Pitt hotel at Pittsburgh on October 24, the following officers were elected for the ensuing year: President, R. P. Forsberg, chief engineer, Pittsburgh & Lake Erie, Pittsburgh; first vice-president, E. A. Rauschart, mechanical superintendent, Montour Railroad, Coraopolis, Pa.; second vice-president, G. M. Sixsmith, superintendent, Pennsylvania, Pittsburgh; secretary, J. D. Conway, secretary, Railway Manufacturers Association, Pittsburgh; and treasurer, E. J. Searles, manager, Schaefer Equipment Company, Pittsburgh.

R. F. C. Loans to Railroads

Railroad loans authorized by the Reconstruction Finance Corporation amounted to \$494,375,728 up to October 31, according to the corporation's monthly report. Of this amount \$6,968,156 had been canceled or withdrawn, \$487,122,572 had been disbursed, and \$74,312,513 had been repaid. In addition to the loans authorized the corporation has approved in principle loans in the amount of \$130,922,097 upon the performance of specified conditions.

Railroad Security Owners' Association Organized

Executives of large savings banks and insurance companies have organized in New York the Railroad Security Owners' Association. The new organization is the result of a reorganization of the Security Owners' Association which has been functioning for several years in the interest of railroad and public utility investors. Henceforth activities will center about railroad securities.

Philip A. Benson, president of the Dime Savings Bank of Brooklyn, has been elected president of the new organization while Milton W. Harrison, for many years head of the Security Owners' Association, will become a member of the governing board.

In outlining the policies of the reorganized association, Mr. Benson said opposition to government ownership would be among its activities. He explained that, although railroad labor unions favored government ownership, the members of the association felt there was no widespread demand for it.

"The association henceforth will scan all legislation affecting the interests of the railroads," Mr. Benson added.

I. C. C. Orders Reduction in Rates On Postal Cards

On a complaint filed by the procurement division of the Treasury Department on behalf of the United States the Interstate Commerce Commission, Division 5, has issued a report finding unreasonable the first-class rating and rates in Official, Southern, Western, and Illinois classifications on postal cards, in carloads, minimum weight 30,000 pounds, when shipped for account of the government on government bills of lading, in cars protected by government locks or seals, and has prescribed a rating of second class, subject to a minimum of 36,000 pounds. The government had asked for a rating of fourth class. The first-class rating had been prescribed by the commission in 1916 and the railroads contended that the gov-

ernment had shown no evidence of change in circumstances and conditions since then but the commission, considering particularly the evidence as to the average values and loading of the shipments and the slight risk involved in their carriage, expressed the opinion that the rating should be reduced to second class. According to the report about 150 carloads of the penny postal cards are shipped annually from Washington and yield a total of more than \$400,000 annually in freight revenue to the railroads. Commissioner Splawn dissented, saying the reduction ordered was in his opinion entirely arbitrary.

Pennsylvania Operated 12 Specials to Columbus

Twelve special trains and extra sections of regular trains were operated by the Pennsylvania from Chicago to the Notre Dame-Ohio State football game at Columbus, Ohio, on November 2. The Ohioan, the Pennsylvania's overnight train from Chicago to Columbus, was operated in four sections, while the Notre Dame team and students were carried in four specials from South Bend, Ind. Other specials were operated from Indianapolis, Ind., Dayton, Ohio, Cincinnati and Cleveland.

U. P. Old Timers Convene in Denver

Approximately 2,000 old time employees of the Union Pacific convened in Denver, Colo., on October 26, for an annual reunion. To accommodate many of the employees, four special trains were operated into Denver from Kansas City, Mo., Omaha, Neb., Salt Lake City, Utah, and Cheyenne, Wyo. A banquet in the evening was attended by 1,700, while 2,000 other Union Pacific employees and their friends, who were not eligible to attend the banquet because they have not qualified for membership as old timers, joined the diners at the Civic Auditorium later to hear addresses made by Carl R. Gray, president, and W. M. Jeffers, executive vice-president, of the Union Pacific, and J. S. Pyeatt, president of the Denver & Rio Grande Western.

New York Central Sponsoring Trip for "Railroad Fans"

The New York Central is sponsoring for November 17 a "Railroad Wonder Trip" from New York to its West Albany, N. Y., shops and Selkirk yards and terminal. This is to accommodate "railroad fans" who desire an opportunity to inspect railroad facilities and equipment.

Persons desiring to make the trip are requested to make reservations in advance and are promised a "most interesting" trip with competent guides as escorts. At the shops demonstrations of actual operations, with lecturers to explain them, will be provided. A special round-trip rate of \$2.50 is offered and separate coaches will be assigned to the party for its exclusive use.

One Hundred Thousandth Passenger on Hiawatha Recipient of Honors

The one hundred thousandth paying passenger to travel on the Hiawatha of the Chicago, Milwaukee, St. Paul &

Pacific, Mrs. Carrie Johnson, 76, South St. Paul, Minn., was the recipient of honors in the Chicago Union station immediately prior to the departure of the train on November 4. As a mechanical device recorded Mrs. Johnson as the one hundred thousandth passenger through the station gates, W. B. Dixon, general passenger agent, asked her to step out of line and be awarded a group of prizes, including travel accessories and a scroll commemorating the occasion. She was also the guest of honor at a ceremony enroute that included the distribution of souvenirs to all passengers on board.

In order to determine the one hundred thousandth passenger, continuous telephone communication was maintained between the station gatemen in Chicago and Minneapolis, Minn., where the southbound Hiawatha departed 30 min. prior to the leaving time of the companion unit from Chicago.

Palmer Named New Haven Trustee

Howard S. Palmer, president of the New York, New Haven & Hartford Railroad, was on November 6 named as one of the trustees who will seek to rehabilitate the road under Section 77 of the Federal Bankruptcy Act. He was named without opposition.

The judge approved Mr. Palmer's appointment, stating: "The court is inclined to the view that in the interest of continuity of operation the sensible thing is to appoint Mr. Palmer. I find myself tending to that point of view." He asked if there were any opposition, and in its absence remarked: "I think it proper to observe that in order to clear the decks for further action I will appoint Mr. Palmer in the confidence that he will serve the court with the same distinction he has shown to his corporation."

James Lee Loomis, president of the Connecticut Mutual Life Insurance Co. of Hartford, also was nominated for a trusteeship, but the judge reserved decision as to additional designees.

Tie Stocks on October 1 Show Small Increase

Reports filed with the Railway Tie Association by 13 tie producing concerns, the combined output of which represents a large percentage of the total output for the country, show that these companies had 5,936,322 crossties on hand on October 1. This represents an increase of 362,241 ties, or 6.5 per cent as compared with the number on hand on September 1, but shows a decrease of 940,601 ties, or 13.7 per cent, as compared with October 1, 1934.

Of the ties available on October 1, 3,026,013, or 51 per cent, were 8 ft. long, while 2,910,309, or 49 per cent were 8½ ft. long. U-ties for use untreated totaled 358,425, or 6 per cent of the total inventory, while oak ties for treatment numbered 4,559,630, or 77 per cent of the total. All other species for treatment numbered 1,018,267, or 17 per cent of the inventory.

Four of the seven districts reporting showed increases in the number of ties in stock, while the other three showed decreases. As usual, the largest number of

ties (2,698,208) was reported by the Fourth district, which comprises Kentucky, Tennessee, Alabama, Mississippi and that portion of Louisiana east of the Mississippi river. The smallest number (5,627) was reported by the Seventh district which includes North Dakota, South Dakota, Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona and New Mexico.

Canada's New Transport Minister

A former New Englander is now in charge of one of the largest Cabinet jobs in the new government at Ottawa. Hon. Clarence D. Howe, who was born in Waltham, Mass., and attended Massachusetts Institute of Technology, is head of the merged portfolios of Railways and Canals and Marine in the King Administration in Canada. It is expected that in the next session of parliament legislation will be put through to formally amalgamate the two Departments under the single heading of Transport.

After graduating from M. I. T., some business association with the Boston firm of J. R. Worcester & Co., and a short term as assistant instructor at M. I. T., Mr. Howe went to Canada and for five

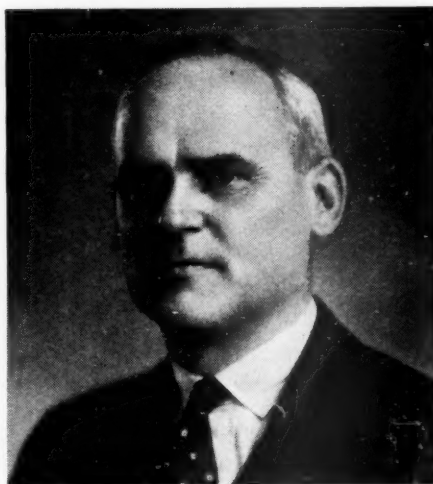


Photo by Ashley & Crippen
Hon. Clarence D. Howe

years, 1908-13, he was professor of civil engineering at Dalhousie University, Halifax. Later he did business as consulting engineer in Halifax, and after three years as chief engineer of the Board of Grain Commissioners of Canada with headquarters at Fort William he organized a company of his own at Port Arthur, a city five miles distant from Fort William, and in that city up until he entered the King Cabinet three weeks ago he made a name for himself as an engineer and contractor.

He built a large number of the terminal grain elevators in Western and Eastern Canada, went to South America to advise the Government of Argentina on elevator problems and he did similar work across the Pacific. He is widely known as a contractor.

One of his first moves after becoming a Minister in the new government was to adopt in large measure the recommendations of Sir Alexander Gibb, eminent British engineer who at the invitation of Premier Bennett made an exhaustive investigation in 1931 of the administration

of the various harbor commissions in Canada. These had developed in some cases into hotbeds of political activity with insufficient attention to the business demands. Within a week after the assumption of his office Mr. Howe abolished all the seven local harbor commissions and placed them under a central federal control, thus making a big saving of money to the federal treasury, which has had to furnish the money both for capital works and for maintenance and operation, and also promoting a greater efficiency. Mr. Howe is 49 years of age.

Club Meetings

The Pacific Railway Club will hold its next meeting at the Palace Hotel, San Francisco, Cal., on November 14. Eliot Jones, professor of transportation at Stanford University, will speak on "The Prospects of the Railroads."

Henry A. Palmer, editor and manager of the Traffic World, will be the guest speaker at the next meeting of the Richmond (Va.) Traffic Club, which will be held at the Hotel John Marshall in that city on November 18.

The next meeting of the Central Railway Club—the annual "Terminal Trainmasters and General Yardmasters Night"—will be held on November 14 at the Statler Hotel, Buffalo, N. Y. Papers on "Railroad Terminal Operation" and "A Yard Clerk's Viewpoint of Terminal Operation" will be presented respectively by F. F. Laird, supervisor of terminals, Chesapeake & Ohio, Richmond, Va., and John J. Flynn, chief clerk in the yard office of the Erie at East Buffalo, N. Y.

The Canadian Roads in September

Net operating revenues of the Canadian Pacific for September totaled \$3,290,218, as compared with \$3,033,580 for September of last year, representing an increase of \$256,638. Gross for the month, \$13,445,645, showed an increase of \$1,402,861, while operating expenses at \$10,155,436 showed an increase of \$1,146,223.

Gross was at the best level for any month since November, 1931, while net was highest for any month since November of last year.

For the nine-month period ended with September, net operating revenues totaled \$11,386,758, which contrasts with \$13,670,107 for the corresponding nine-month period of last year, a decrease of \$2,283,349. Gross revenues for the nine months at \$92,040,422 showed an increase of \$1,140,103, while operating expenses at \$80,653,663 showed an increase of \$3,423,452.

An increase of nearly a million dollars in the operating revenues of the all-inclusive Canadian National System was shown in September over the figures for September, 1934. Operating revenues were \$15,901,121, as against \$14,940,269 for September of last year. The increase in net operating revenue for the month was \$282,429 over last year.

For the nine months operating revenues totaled \$125,130,179, which was an increase of \$3,167,470 over 1934. Operating expenses were \$118,964,515, an increase of \$4,144,310 over 1934. Net operating revenues for the nine months were \$6,165,664, a decrease of \$976,840.

Supply Trade

Henry W. Foulds has been elected vice-president of **The Permutit Company**, New York. Mr. Foulds will correlate and direct all sales, promotion and advertising.

The Paint Division of **Aluminum Industries, Inc.**, Cincinnati, Ohio, manufacturer of Permite Aluminum paint has appointed **C. L. Welch**, **Lee S. Abbott** and **George E. Fox**, as district managers. Mr. Welch will contact the trade in Minnesota, Wisconsin, Michigan, Indiana, Illinois and Ohio, with headquarters at the Chicago branch office. Mr. Abbott, will represent Permite in Kansas, Missouri, Oklahoma, Arkansas, Louisiana and Texas, with his headquarters at 308 Wright building, Tulsa, Okla., and Mr. Fox will cover the territory along the Atlantic seaboard, including that portion of the country east of Pittsburgh and as far south as Virginia. His headquarters will be in the office of Aluminum Industries, Inc., in New York City.

The General Electric Company, has centralized at its Erie, Pa., works all commercial and engineering activities of its Transportation Department, with the exception of its railroad signal equipment. **E. P. Waller** is manager, responsible for sales and commercial activities of the department, and **H. I. Guy** is assistant to Mr. Waller; **C. M. Davis** is engineer, in executive charge of the department and responsible for all engineering matters; **E. M. Bill** is manager of the general engineering section; **W. M. Guynes** of the locomotive and electrification section; **G. W. Wilson** of the urban equipment section and **W. J. Walker** of the supply and renewal parts section. Signal equipment will continue to be handled by **H. M. Jacobs** at Schenectady, N. Y.

George E. Clifford, assistant manager of sales in the pipe division of the **Republic Steel Corporation**, has been promoted to district sales manager, with headquarters in Los Angeles, Cal., to succeed **George F. Emanuels**, resigned. Mr. Clifford attended the University of Pittsburgh and in 1917, joined the Royal Flying Corps where he served until December, 1918. From February, 1919, until 1925, he was connected with the sales department of the Atlas Powder Company at Pittsburgh, Pa., in the latter year becoming district representative for the A. M. Byers Company, with headquarters at Cincinnati, Ohio. Two years later he was made manager of the central district and later manager of the Pittsburgh district. He entered the employ of the Republic Steel Corporation in August, 1930, as assistant manager of sales in the pipe division, which position he has held until his recent promotion.

T. Pierre Champion, who has been elected president of the **Champion Rivet Company**, Cleveland, Ohio, succeeding his father, the late **David J. Champion**, who founded the company in 1895, was graduated from the University of Notre Dame in 1922 and is now 36 years old.

T. Pierre Champion, following his graduation took a position with the **Champion Rivet Company** and for the first two years was employed in the plant making rivets



T. Pierre Champion

and since 1928 has been vice-president in charge of sales. In 1931 the company expanded the scope of its service to the metal fabricating industry and placed before the trade a complete line of coated welding electrodes, of which development T. Pierre Champion was in direct charge.

N. H. Orr, until recently a member of the staff of the American Iron & Steel Institute, New York, has been appointed general manager of sales of the **Colorado Fuel & Iron Company**, with headquarters at Denver, Colo., the appointment being a step on the part of the company to build up its sales activities which were curtailed owing to the depression and the financial difficulties through which the company is passing. It is believed that a



N. H. Orr

consolidation of the selling operations, which for many years have been divided into three principal lines, will effect better coverage of the company's territory and improve service to its trade. Mr. Orr was educated at Carnegie Institute of Technology, Pittsburgh, and upon finishing school in 1909, entered the employ of the American Bridge Company with which company he continued until 1926, holding various positions. In the latter year he entered the employ of the Jones & Laughlin Steel Corporation, Pittsburgh, in the sales department. Later he joined the staff of the American Iron & Steel Institute.

Equipment and Supplies

FREIGHT CARS

THE CHICAGO, ROCK ISLAND & PACIFIC has contracted with the Ryan Car Company for the conversion of 170 box cars to single deck stock cars, the order being in addition to the 320 cars reported in the *Railway Age* of August 31, page 288.

IRON AND STEEL

THE LOUISVILLE & NASHVILLE expects to place a contract with the Tennessee Coal Iron & Railroad Company soon, for 20,000 tons of 100-lb. rails.

SIGNALING

THE INTERBOROUGH RAPID TRANSIT COMPANY has ordered from the Union Switch & Signal Company materials for the signaling of its local tracks on the Broadway line, between Ninety-sixth street and 145th street, New York City. The order includes 66 subway color-light signals, 123 relay and instrument cases, with direct-current relays, electro-pneumatic automatic train stops, etc.

MOTOR VEHICLES

THE CONNECTICUT COMPANY, an affiliate of the New York, New Haven & Hartford, has accepted delivery of one 30-passenger motor coach from the Twin Coach Corporation.

Construction

CENTRAL OF NEW JERSEY.—A contract has been given to the Tuller Construction Company, Red Bank, N. J., at \$220,000 for the widening of the highway underpass on New Jersey State Highway Route No. 31 at Bridge No. 201, Ward street, Newark, N. J. The company has authorized the construction of a new station layout, including streets and driveways, at South Amboy, N. J., to cost about \$75,000. Bids have already been received for the construction of the streets and driveways and bids will be received November 12 for the new eastbound station and westbound shelter shed.

LEHIGH VALLEY-NEW YORK CENTRAL-ERIE-PENNSYLVANIA-NEW YORK, CHICAGO & ST. LOUIS-SOUTH BUFFALO-BALTIMORE & OHIO.—A general plan and estimate of cost of \$717,000 for the elimination of the Tift street crossing of these roads in Buffalo, N. Y., has been approved by the New York Public Service Commission. The plan was submitted by the Lehigh Valley and approved by the other interested railroads and by the Buffalo Grade Crossing and Terminal Station Commission. See *Railway Age*, June 15, page 947.

Financial

BOSTON & MAINE.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority to enter into a new equipment trust agreement covering 1,976 box cars and 500 steel hopper cars acquired in 1929 and 1930 at a cost of \$5,389,993. Of this \$2,684,796 has been paid but it is proposed to enter into a new agreement by which the balance will be paid serially over a period of nine years at a reduced rate of annual payment.

CHICAGO & EASTERN ILLINOIS.—Compensation of Counsel.—The Interstate Commerce Commission has reaffirmed its order of May 13 last allowing compensation of \$8,000 to Ernest S. Ballard. The trustee had asked for modification of the order permitting a payment of \$15,000 to Mr. Ballard, as counsel in the litigation with the Louisville & Nashville over the proposed discontinuance of passenger interchange between the two roads by the "Dixie" limiteds.

CHICAGO, SOUTH BEND & MILWAUKEE.—Trustees.—The Interstate Commerce Commission has ratified the appointment of John N. Shannahan and Claude J. Jackson as trustees of this company's property, provided that compensation to Mr. Shannahan be only in his capacity as trustee as fixed by the court.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—New Director.—Robert S. Sinclair, Indianapolis, Ind., was elected a director of this company at the annual meeting of the stockholders. Mr. Sinclair succeeds the late J. A. Kingan.

DENVER & RIO GRANDE WESTERN.—Trustees.—The Interstate Commerce Commission has ratified the appointment of T. M. Schumacher and Sidney M. Ehrman as trustees of this company, that of the former being on condition that he receive compensation only as trustee and not for any other services. The appointment of Charles Elsey, president of the company, as trustee was denied on the ground that "two trustees should be sufficient" and that "we deem it inadvisable to ratify appointment of trustees, the majority of whom are officers of the debtor."

GREAT NORTHERN.—Refunding.—At a meeting of the directors in New York last week it was decided to call a stockholders' meeting for next month to seek approval for the issuance of convertible bonds to meet the maturity on July 1 of next year of approximately \$106,000,000 of general mortgage 7 per cent bonds.

ILLINOIS CENTRAL.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a five-year extension of its loan of \$7,778,000 due December 7.

MINNEAPOLIS & ST. LOUIS.—Receivers' Certificates.—The Interstate Commerce Commission has authorized the receivers

of this company to issue \$1,185,000 of receivers' certificates to renew or extend a similar amount falling due this month, or already overdue.

NEW YORK, NEW HAVEN & HARTFORD.—Court Requests Interest Payment Delay.—Acting on an order from the federal court at Hartford, Conn., this company withheld interest payments totaling \$420,475 due November 1 on the following issues of this company's securities: 4 per cent debentures of 1956; Providence Securities Company guaranteed 4 per cent debentures of 1957; Harlem River & Port Chester first mortgage 4 per cent bonds of 1954; Housatonic Railroad consolidated mortgage 5 per cents of 1937; Naugatuk Railroad first mortgage 4 per cent bonds of 1954, and N. Y. N. H. & H. 4 per cent debentures of 1957. At the same time, the court authorized the payments due on equipment obligations.

OREGON SHORT LINE.—Abandonment.—Examiner Thomas F. Sullivan of the Interstate Commerce Commission has recommended in a proposed report that the commission find that public convenience and necessity have not been shown to justify the abandonment of part of this company's Raft River branch, from Declo, Idaho, to Idaho, and that the application be denied without prejudice to a renewal after two years in event of failure of the line to show substantial improvement in operating results. The report said that persons and communities dependent upon the line should realize that its continued existence depends entirely upon their willingness and ability to furnish sufficient traffic to warrant its operation.

PITTSBURGH & WEST VIRGINIA.—R.F.C. Loan.—The Interstate Commerce Commission has authorized the extension for three years of the maturity date of a loan of \$203,419 by the Reconstruction Finance Corporation to this company which matured November 4, provided that notes representing the debt of the Acme Coal Cleaning Company to the P. & W. Va. be pledged with the R.F.C. as collateral.

SOUTHERN PACIFIC.—Securities.—The Interstate Commerce Commission has authorized this company to waive the redemption privilege provided for in its \$12,000,000 of 10-year 4 per cent serial bonds authorized March 23 last and sold to the Public Works Administration (now held by the Reconstruction Finance Corporation), to provide that interest on the bonds begin on a common date—November 1,—and that the temporary bonds be exchanged forthwith for definitive bonds. These changes were made at the request of the R. F. C.

Dividends Declared

Bangor & Aroostook.—62c, quarterly; Preferred, \$1.75, quarterly, both payable January 1 to holders of record November 30.

Average Prices of Stocks and of Bonds

	Nov. 6	Last week	Last year
Average price of 20 representative railway stocks..	36.50	35.81	35.49
Average price of 20 representative railway bonds..	72.30	72.46	73.74

Railway Officers

EXECUTIVE

J. K. McNeillie, vice-president of the Napierville Junction, with headquarters at Montreal, Que., has also been elected resident vice-president of the Delaware & Hudson, with the same headquarters, succeeding **F. P. Gutelius**, deceased. Mr. McNeillie entered the service of the Grand Trunk of Canada in 1891 as call boy at the engine house at Lindsay, Ont., and subsequently served an apprenticeship as a locomotive fitter and machinist. In 1893 he completed apprenticeship at the Point St. Charles, Montreal, shops, and then continued as a journeyman fitter and machinist. In 1895 he became clerk in the trainmaster's office of the Canadian Pacific at Farnham, Que., later becoming superintendent's stenographer and superintendent's chief clerk. Mr. McNeillie was transferred to Winnipeg, Man., in 1897, as clerk in the general superintendent's office and then became general superintendent's chief clerk and car service agent, Western lines. In 1903 he was transferred to the staff of the superintendent of car service, Montreal, where he was in charge of distribution of passenger equipment for the system. In 1907 Mr. McNeillie became assistant superintendent Toronto terminals and then served as district superintendent successively at Toronto, Ont., London, and Farnham, Que., and then as superintendent Montreal terminals, district superintendent at Montreal, and acting general superintendent Eastern lines, all for the Canadian Pacific. From 1915 to 1917 Mr. McNeillie served as general superintendent of the Canadian Government Railways at Moncton, N. B., and from 1917 to 1921 he was division superintendent of the Susquehanna division of the Delaware & Hudson at Oneonta, N. Y. From 1921 until October of this year, Mr. McNeillie was superintendent on the staff of the vice-president and general manager of the Delaware & Hudson at Albany, N. Y., performing duties assigned by the management. Mr. McNeillie was appointed vice-president of the Napierville Junction on October 3.

OPERATING

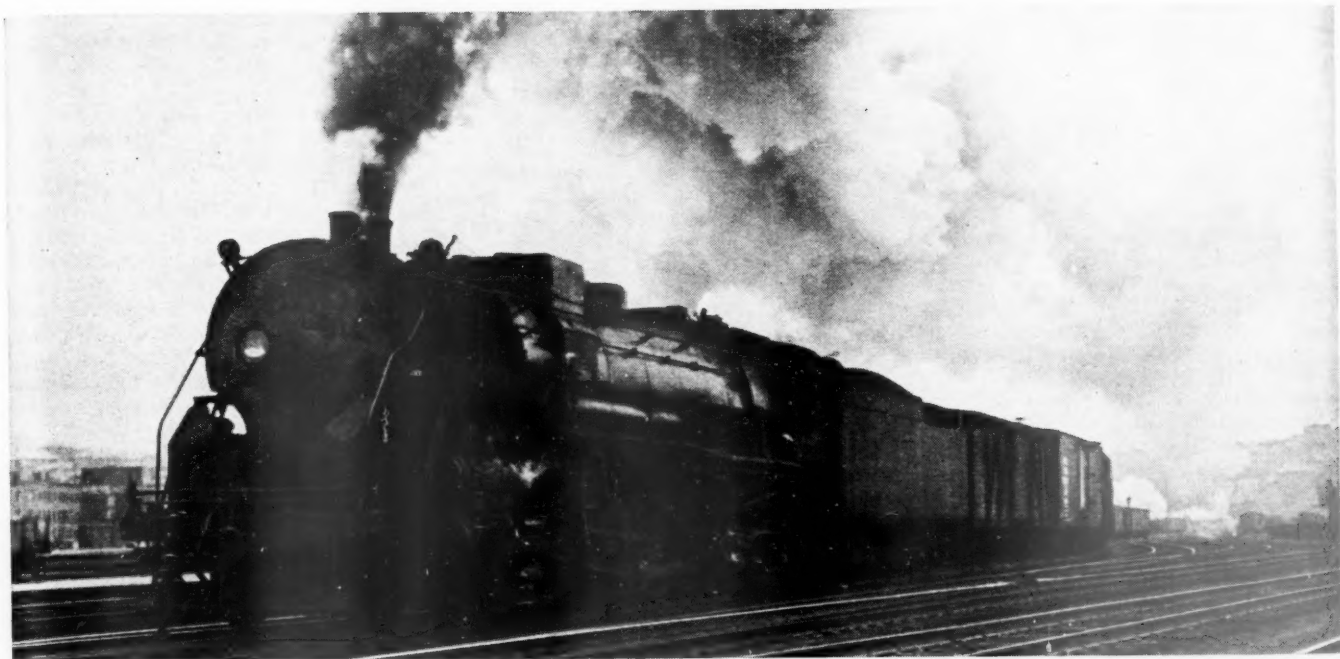
R. K. Jett has been appointed superintendent of the Interstate Railroad Company, with headquarters at Andover, Va., succeeding **J. C. McKenzie**, deceased.

W. P. Dolan, car accountant of the Atchison, Topeka & Santa Fe, has been appointed superintendent of car service, with headquarters at Topeka, Kan., succeeding **J. W. Nowers**, deceased.

T. E. Williams, assistant superintendent on the Union Pacific, with headquarters at Cheyenne, Wyo., has been promoted to superintendent of the Wyoming division, with headquarters at Green River, Wyo., where he succeeds **C. C. Barnard**, whose death was noted in the *Railway Age* of November 2. **F. P. Fleisher**, train-

Continued on next left-hand page

PREPARE *for* IMPROVED BUSINESS



... with Improved POWER

Increased railroad traffic will soon necessitate the purchase of new motive power units. » » » Get the most out of the increased volume of business by handling it with the most efficient locomotives which can be built. » » » Super-Power Locomotives provide 25% to 30% more power at speeds than locomotives ten years old and older—with a corresponding increase in efficiency.



LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

master at Green River, has been appointed assistant superintendent at Cheyenne, to replace Mr. Williams, and **B. F. Wells**, trainmaster at Ogden, Utah, has been transferred to Green River, to replace Mr. Flesher. **J. M. Kelley**, night chief dispatcher at Green River, has been promoted to trainmaster at Ogden, to succeed Mr. Wells.

TRAFFIC

C. W. Bridges has been appointed general freight agent in charge of traffic matters and solicitation for the Waco, Beaumont, Trinity & Sabine, with headquarters at Trinity, Tex.

R. P. Starr, traveling freight agent on the Great Northern at Seattle, Wash., has been appointed general agent, with headquarters at Tacoma, Wash., to succeed **M. J. Seabrook**, who has been assigned to other duties.

F. A. Murphy, general agent of the Maine Central and the Boston & Maine, with headquarters at New York, has been appointed assistant general freight agent of the Maine Central, with headquarters at Portland, Me.

William J. McCann, general passenger agent of the Bessemer & Lake Erie, has retired under the company's pension rules, after 44 years of service. The position of general passenger agent has been discontinued. **Ralph B. Krichbaum**, passenger representative, will be in charge of the passenger department, with headquarters at Pittsburgh, Pa.

L. R. Challoner, assistant general freight and passenger agent on the Northern Pacific, with headquarters at Helena, Mont., has been appointed to the newly created position of assistant freight traffic manager at St. Paul. **N. D. Harding**, city freight agent at Duluth, has been appointed assistant general freight and passenger agent at that point, succeeding **J. P. Roddy**, who has been appointed assistant general freight agent at St. Paul. **Mr. Roddy** replaces **Howard H. Ellsworth**, who has been appointed assistant general freight and passenger agent at Helena, succeeding **Mr. Challoner**.

A. W. Aylin, assistant general freight agent on the Missouri Pacific, with headquarters at New Orleans, La., has been promoted to general freight agent at Houston, Tex., to succeed **J. W. Daley**, who has been appointed general agent, freight and passenger departments, at Galveston, Tex., to succeed **E. M. Weinberger**, who has been appointed to the newly-created position of general agent at Houston, Tex. **D. L. Carter**, general agent, freight and passenger departments, at Detroit, Mich., has been promoted to assistant general freight agent at New Orleans, to succeed **Mr. Aylin**. **R. J. Nyman**, commercial agent at Detroit, has been appointed general agent with the same headquarters, to replace **Mr. Carter**. **J. W. Williams**, general agent, freight and passenger departments, with headquarters at Birmingham, Ala., has been transferred to Chattanooga, Tenn., to succeed **C. C. Hart**,

who has been appointed commercial agent at Memphis, Tenn., to replace **J. J. Mulholland**, who has been appointed general agent, freight and passenger departments, at Oklahoma City, Okla. **Mr. Mulholland** succeeds **V. C. Fagan**, who has been transferred to Birmingham, to replace **Mr. Williams**.

ENGINEERING AND SIGNALING

E. D. Flad, division engineer of the Eastern division of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been appointed acting engineer maintenance of way, Southern General division, with headquarters at Wilmington, Del., succeeding **R. P. Graham**, who has been granted a leave of absence because of ill health. The previous announcement of this change, which appeared in the *Railway Age* of November 2, page 592, was in error in reporting the names of the officers involved as **E. H. Flood** and **R. T. Graham**.

William Elmer, special engineer on the staff of the chief engineer of the Pennsylvania, retired from active duty on November 1. **Mr. Elmer** was born at Trenton, N. J., on September 29, 1870, and was graduated from Princeton University in 1892 and Princeton Electrical School in 1895. **Mr. Elmer** first entered the service of the Pennsylvania during the summer of 1892 as fireman and subsequently became apprentice at the Meadows Shops, near Jersey City, in 1896. He served successively as special apprentice at



William Elmer

the Altoona Works, general foreman of electric car service of the West Jersey & Seashore (now P. R. R.), assistant master mechanic at the Altoona Machine shops. In 1903 he was appointed assistant engineer of motive power at Altoona, Pa., and in 1906 he became master mechanic of the Pittsburgh division. In 1911 he became superintendent of motive power of the Buffalo and Allegheny division. From 1917 to 1926, **Mr. Elmer** was superintendent, successively, of the Schuylkill, Philadelphia and Middle divisions. In January, 1926, he was promoted to special engineer at Philadelphia. **Mr. Elmer** is a member of the American Society of Mechanical Engineers and is the author of

a paper of the A. S. M. E. entitled "Avoidable Waste in the Operation of Locomotives and Cars."

SPECIAL

George O. Brophy, special representative of the department of public relations of the Union Pacific, who retired on November 1, as noted in the *Railway Age* of November 2, was born at Eagle, Wis., on November 14, 1864. **Mr. Brophy** entered the service of the Union Pacific in July, 1888, as a brakeman on the Wyoming division, later being appointed a conductor on the Nebraska division. He then served successively as assistant superintendent of the Utah division, superintendent of the Wyoming and Nebraska divisions, general superintendent of the Southern district, and superintendent of the Kansas division. In 1923 he was appointed special representative of the legal department, with headquarters at Omaha, Neb., and in 1926 he was transferred to the department of public relations, where he remained until his retirement.

L. L. Perrin, advertising assistant to the passenger traffic manager of the Northern Pacific, has been appointed advertising manager, with headquarters as before at St. Paul, Minn. **Mr. Perrin** will have charge of advertising and public relations work. In the latter respect, he takes over the duties of the late **F. W. DeGuire**, executive assistant to the president, whose death on July 2 was noted in the *Railway Age* of July 13. **Mr. Perrin** was born in 1892 in Nebraska, and after attending the Nebraska State Teachers' college, he engaged in newspaper work. After serving in various newspaper capacities at St. Joseph, Mo., and Des Moines, Iowa, he went to St. Paul in 1916 to join the staff of the St. Paul Dispatch-Pioneer Press, and was later connected with the St. Paul Daily News. In December, 1926, he entered the service of the Northern Pacific as advertising assistant to the passenger traffic manager, which position he was holding at the time of his recent appointment.

OBITUARY

Marion D. Wampler, general car foreman of the Interstate Railroad Company, died at his home in Appalachia, Va., on October 13. **Mr. Wampler** was 48 years of age and had been with the Interstate for 20 years.

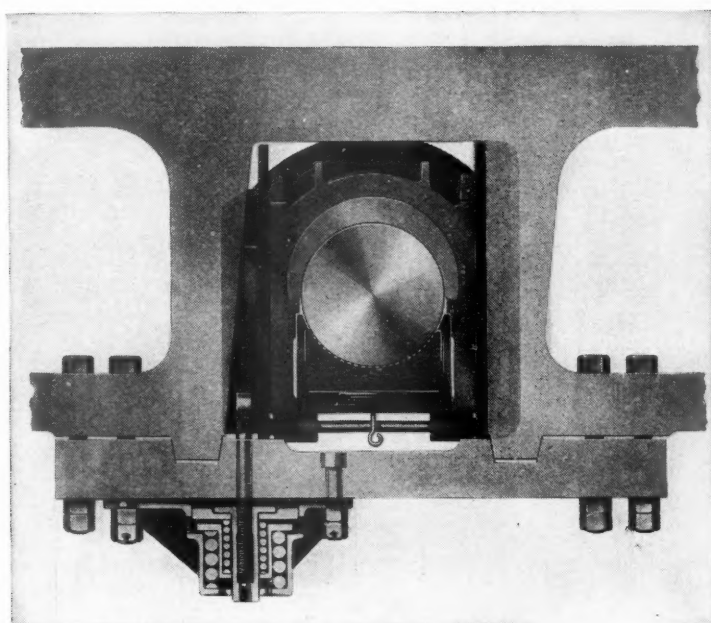
J. C. McKenzie, superintendent of the Interstate Railroad Company, with headquarters at Andover, Va., died suddenly of heart disease at his home at Appalachia, Va., on October 24. **Mr. McKenzie** was 46 years old and had been in the service of the Interstate about 24 years.

Frank C. Hoff, who retired on August 31, 1925, as assistant to the general manager of the Pennsylvania, with headquarters at Philadelphia, Pa., died in St. Luke's Hospital, Philadelphia, on October 31 after an illness of several weeks. **Mr. Hoff** was 80 years old and had been in the service of the Pennsylvania for 52 years.

Tables of Revenues and Expenses of Railways begin on next left-hand page



WHEN TWO SURFACES RUB THEY BOTH GET HOT!



Even when properly lubricated the temperature of rubbing metal surfaces rises. A little slack or excess pressure greatly increases the temperature.

Road tests show that in the case of properly adjusted driving boxes, this temperature change varies 150 to 200 degrees over short periods of time.

If excessive maintenance and hard riding are to be avoided this temperature change and its corresponding expansion and contraction must be compensated for.

Franklin Automatic Compensator and Snubber automatically maintains driving boxes in correct adjustment. It avoids both pounding and sticking boxes. It makes a smoother riding engine and keeps maintenance at a minimum.

May we send you further details?

No locomotive device is better than the replacement part used for maintenance. Genuine Franklin repair parts assure accuracy of fit and reliability of performance.

FRANKLIN RAILWAY SUPPLY COMPANY, Inc.
NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1935

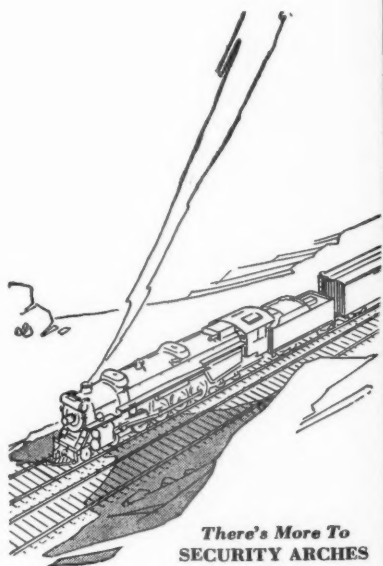
Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income			
		Freight	Passenger	Total	(inc. misc.)	Way and structures	Maintenance of equipment	Traffic	Trans- portation			Total	Operating income	(After depr. & retir. 1935	Before depr. & retir. 1934
Akron, Canton & Youngstown.....	Sept. 171	\$152,028	\$23	\$159,445	\$33,071	\$15,763	\$7,795	\$46,052	\$110,341	69.2	\$49,104	\$41,637	\$29,456	\$10,928	\$34,279
Alton	Sept. 949	1,366,287	336	1,439,553	220,784	138,572	74,317	437,523	974,390	67.7	464,963	394,951	267,170	219,554	312,363
Alton	Sept. 949	903,039	149,019	1,254,226	239,218	196,376	45,987	468,242	1,029,532	84.1	194,694	123,244	51,835	6,198	19,739
Alton	Sept. 949	7,384,777	1,277,631	10,086,777	2,039,329	1,697,216	420,990	4,133,863	8,828,769	87.5	1,238,008	620,497	229,913	536,428	686,926
Atchison, Topeka & Santa Fe System.....	Sept. 13,260	9,147,629	1,192,134	10,339,763	1,765,815	2,846,767	374,995	3,892,873	9,320,333	81.6	2,107,097	1,274,196	1,274,752	2,030,381	2,207,826
Atlanta & West Point.....	Sept. 93	78,216,162	10,163,509	88,379,671	13,173,894	24,267,391	3,349,424	35,418,680	79,439,124	81.6	17,959,745	10,247,113	10,052,452	12,474,039	18,534,788
Atlanta & West Point.....	Sept. 93	102,029	20,179	122,208	14,419	24,936	7,449	37,436	118,336	82.1	25,783	19,293	5,593	6,840	11,748
Atlanta & West Point.....	Sept. 93	792,306	177,368	969,674	1,144,619	171,008	227,592	647,554	1,035,479	90.5	109,140	48,084	61,480	117,316	8,286
Western of Alabama.....	Sept. 133	84,713	21,630	106,343	23,751	27,347	7,041	49,923	115,789	93.8	7,615	3,607	3,607	14,945	12,475
Atlanta, Birmingham & Coast.....	Sept. 133	671,233	178,819	850,052	200,310	267,202	62,053	432,404	1,033,735	105.1	49,775	122,842	83,572	46,367	9,037
Atlanta, Birmingham & Coast.....	Sept. 639	204,700	9,409	214,109	44,070	45,855	20,987	92,848	226,848	93.8	15,082	3,170	2,550	3,037	9,037
Atlanta, Birmingham & Coast.....	Sept. 639	1,920,221	72,535	1,992,756	371,188	411,989	192,272	891,845	2,088,916	92.8	161,670	47,990	72,174	215,347	34,383
Atlantic Coast Line.....	Sept. 5146	2,072,418	297,013	2,369,431	384,687	689,928	109,339	1,156,907	2,487,284	89.4	295,465	145,131	212,880	146,168	403,065
Atlantic Coast Line.....	Sept. 5147	21,649,176	4,508,541	26,157,717	3,749,827	6,166,379	1,055,662	11,895,132	24,367,392	81.6	5,502,063	2,296,556	1,631,486	3,340,919	3,340,919
Charleston & Western Carolina.....	Sept. 342	138,821	1,541	140,362	14,404	24,182	5,766	30,901	113,822	78.7	30,822	13,822	16,831	6,222	29,618
Charleston & Western Carolina.....	Sept. 342	1,416,368	12,186	1,428,554	1,467,831	247,210	54,454	501,852	1,080,747	73.6	387,084	234,992	234,249	290,306	294,618
Baltimore & Ohio.....	Sept. 6,439	10,884,621	855,645	11,740,266	1,234,210	2,445,168	359,883	4,175,467	8,668,195	70.8	3,654,568	3,133,318	2,519,549	2,413,238	3,131,640
Baltimore & Ohio.....	Sept. 6,440	90,177,617	7,338,745	97,516,362	8,929,094	22,227,952	3,333,880	37,098,700	77,706,307	74.6	26,515,263	20,934,023	17,343,634	18,306,556	23,633,640
Staten Island Rapid Transit.....	Sept. 23	43,971	678,809	1,117,584	113,244	183,535	16,314	743,833	1,172,759	104.9	55,175	207,183	390,970	89,220	326,389
Bangor & Aroostook.....	Sept. 603	265,517	9,727	275,244	99,653	83,478	4,762	95,701	311,048	106.9	20,031	41,005	18,336	6,007	6,007
Bangor & Aroostook.....	Sept. 603	4,229,676	201,899	4,431,575	895,544	753,582	59,397	1,146,537	3,045,423	66.0	1,571,648	1,178,800	1,084,590	1,306,526	1,306,526
Bessemer & Lake Erie.....	Sept. 225	1,013,559	726	1,024,247	78,129	151,591	11,246	168,421	546,855	53.4	477,392	385,515	403,978	255,745	463,458
Bessemer & Lake Erie.....	Sept. 225	7,246,190	6,378	7,252,568	841,065	2,285,425	104,846	1,365,277	4,851,959	66.2	2,481,251	1,996,280	2,165,932	1,281,890	2,694,263
Boston & Maine.....	Sept. 2,000	2,483,725	539,056	3,022,781	487,255	532,053	55,565	1,427,324	2,682,983	75.6	864,599	654,582	499,767	596,241	640,507
Boston & Maine.....	Sept. 2,020	22,647,131	5,116,814	27,763,945	4,082,416	5,175,248	566,520	13,290,454	24,741,776	76.4	7,636,985	5,814,187	4,326,976	4,192,169	5,565,490
Brooklyn Eastern District Terminal.....	Sept. 10,91	96,222	.....	96,222	6,477	8,867	118	25,530	46,721	47.64	51,551	41,917	29,523	.....	.....
Brooklyn Eastern District Terminal.....	Sept. 10,91	751,989	.....	751,989	770,883	41,912	85,876	1,892	408,318	53.17	362,565	298,082	298,642	257,813	.....
Burlington-Rock Island	Sept. 255	63,298	5,182	68,480	14,614	13,455	4,413	39,129	79,062	107.4	5,449	12,067	23,576	29,951	21,138
Burlington-Rock Island	Sept. 277	510,185	36,023	546,208	131,247	129,689	38,774	367,147	734,340	124.2	143,040	203,404	287,243	217,266	262,996
Cambria & Indiana.....	Sept. 37	73,364	.....	73,364	73,523	37,259	323	9,789	58,705	79.85	14,818	2,601	65,405	39,621	81,412
Cambria & Indiana.....	Sept. 37	785,102	.....	786,468	57,625	354,770	3,117	101,694	568,660	72.31	217,808	49,331	654,028	603,440	798,196
Canadian Pacific Lines in Maine.....	Sept. 233	78,664	14,179	92,843	106,154	36,056	9,080	49,666	132,369	124.7	26,215	32,215	44,367	34,261	42,358
Canadian Pacific Lines in Maine.....	Sept. 233	1,157,662	141,203	1,298,865	131,247	323,106	83,492	558,138	1,348,921	94.8	73,070	19,060	150,154	19,702	132,158
Canadian Pacific Lines in Vermont.....	Sept. 85	11,352	75,458	86,810	11,352	18,151	4,036	57,012	98,344	130.3	22,886	27,886	.....	.....	43,654
Canadian Pacific Lines in Vermont.....	Sept. 85	498,957	88,525	587,482	703,107	118,068	189,208	495,154	890,023	126.6	186,916	231,917	.....	.....	379,799
Central of Georgia.....	Sept. 1,926	1,050,624	98,652	1,149,276	1,262,317	230,632	50,179	477,635	948,275	75.1	314,042	240,812	215,594	51,979	283,363
Central of Georgia.....	Sept. 1,926	8,557,133	931,074	9,488,207	1,056,142	1,359,906	2,279,602	4,716,755	9,186,674	86.0	1,499,468	840,470	560,704	418,777	1,177,805
Central Railroad of New Jersey.....	Sept. 684	1,813,133	2,527,063	4,340,196	174,384	455,944	49,188	1,010,169	1,794,710	71.0	732,353	208,224	113,464	107,978	248,570
Central Railroad of New Jersey.....	Sept. 684	17,275,705	3,358,427	20,634,132	2,087,827	4,114,512	419,276	9,252,820	16,029,867	72.6	6,057,960	3,113,715	2,048,804	2,418,595	3,303,555
Central Vermont	Sept. 455	361,941	38,560	400,501	442,834	75,170	15,386	205,702	390,735	88.2	52,099	34,689	22,054	41,825	51,478
Central Vermont	Sept. 455	3,297,128	332,473	3,629,601	4,013,265	789,732	128,374	1,850,833	3,580,542	89.2	432,723	285,464	178,831	35,201	445,124
Chesapeake & Ohio.....	Sept. 3,110	9,062,739	247,302	9,310,041	1,021,649	1,646,136	169,341	2,121,195	5,266,890	57.4	4,422,817	3,532,339	3,510,356	3,777,968	4,193,478
Chesapeake & Ohio.....	Sept. 3,112	76,833,692	2,094,154	78,927,846	8,779,849	14,923,147	1,627,869	18,935,330	47,059,252	54.3	35,080,778	27,338,887	27,034,366	4,193,478	33,233,726
Chicago & Eastern Illinois.....	Sept. 938	880,972	97,550	978,522	1,116,937	205,905	51,785	443,291	903,904	80.9	213,033	162,986	29,673	74,400	79,887
Chicago & Eastern Illinois.....	Sept. 938	7,617,210	826,544	8,443,754	964,909	1,667,978	466,834	3,971,055	7,881,040	81.7	1,764,869	1,262,592	1,778,933	337,501	634,152
Chicago & Illinois Midland.....	Sept. 131	222,500	980	223,480	231,688	59,002	15,528	63,671	189,055	81.6	42,633	38,183	44,208	89,872	57,902
Chicago & Illinois Midland.....	Sept. 131	2,343,816	9,291	2,353,107	242,770	297,083	146,497	627,076	1,724,963	71.1	702,807	607,991	635,050	565,871	759,075
Chicago & North Western.....	Sept. 8,428	5,921,103	712,587	6,633,690	1,313,118	1,408,699	153,054	2,636,098	5,803,930	78.5	1,587,222	1,135,346	859,941	898,707	1,284,101
Chicago & North Western.....	Sept. 8,428	43,655,909	6,824,404	50,480,313	5,993,197	12,817,231	1,481,091	22,413,520	58,941,184	86.4	7,684,723	3,430,994	3,375,245	4,997,805	5,997,805
Chicago, Burlington & Quincy.....	Sept. 9,036	6,421,512	1,703,606	8,125,118	1,259,682	1,910,009	193,968	2,634,881	5,886,313	71.1	2,267,293	1,444,321	1,361,629	1,752,374	2,103,995
Chicago, Burlington & Quincy.....	Sept. 9,036	47,204,772	5,144,888	52,349,660	9,150,652	11,096,642	1,979,480	22,319,452	47,627,672	80.7	11,373,493	6,772,933	3,866,967	7,389,407	9,789,407
Chicago Great Western.....	Sept. 1,514	1,330,420	46,250	1,376,670	1,484,390	177,702	54,029	519,918	997,038	67.2	487,352	436,764	232,314	208,708	275,309
Chicago Great Western.....	Sept. 1,512	10,063,403	378,965	10,442,368	11,269,108	1,651,531	490,673	8,899,716	8,899,716	79.0	2,369,392	1,863,541	321,826	858,140	711,880
Chicago, Indianapolis & Louisville.....	Sept. 647	612,637	43,915	656,552	740,800	160,221	28,634	580,578	784,000	78.4	160,221				

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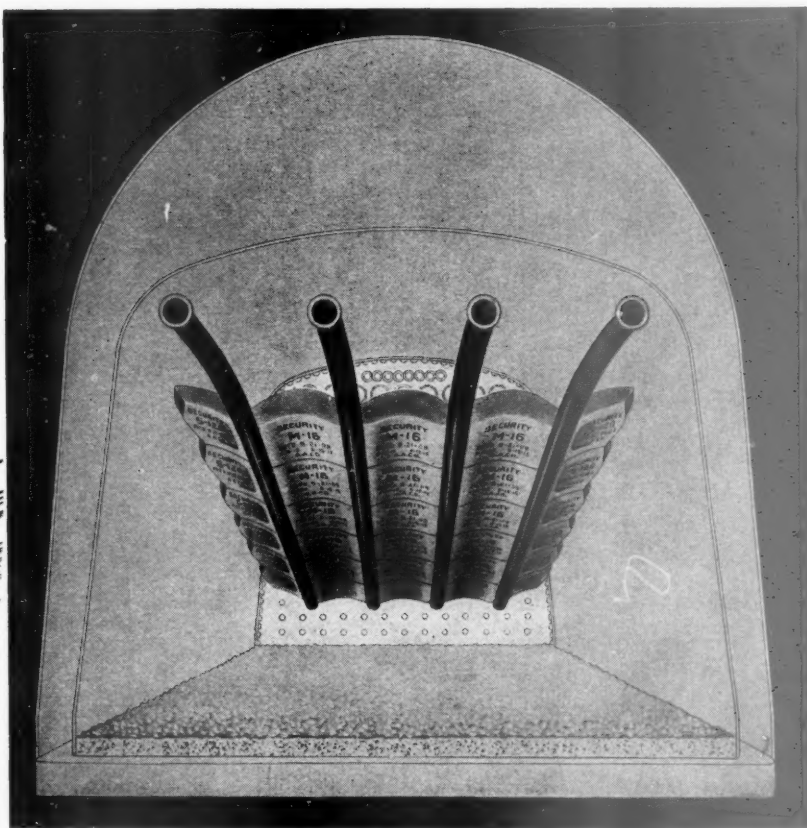
SECURITY ARCH SERVICE

Saves Dollars for You

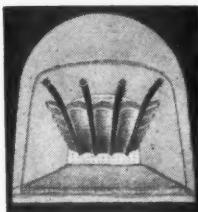
The fundamental idea of sectional arch brick supported on tubes has not changed since the Security Arch was first introduced. ● But we have learned a lot about combustion and Brick Arch design in the years of specialization on these problems. ● This wealth of experience is at the service of the railroads in arranging the Brick Arch for new power or in re-designing the arch where modernizing of existing power makes it advisable.



*There's More To
SECURITY ARCHES
Than Just Brick*



**HARBISON-WALKER
REFRACTORIES CO.**
Refractory Specialists



**AMERICAN ARCH CO.
INCORPORATED**
*Locomotive Combustion
Specialists* * * *

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Net from railway operation	Net railway operating income				
		Freight	Passenger (inc. misc.)	Total	Traffic	Trans- portation	Total		Operating income	After depr. & retir. 1935	Before depr. & ret. 1934		
Chicago, Rock Island & Gulf..... Sept. 9 mos.	722	\$281,121	\$24,708	\$305,829	\$50,865	\$41,607	\$15,729	\$106,819	\$235,928	76.6	\$72,163	\$24,173	\$7,676
Chicago, St. Paul, Minneap. & Omaha Sept. 9 mos.	722	2,569,434	214,014	2,883,297	402,045	298,717	143,420	1,048,280	2,109,006	73.1	610,568	1,764	42,885
Chicago, St. Paul, Minneap. & Omaha Sept. 9 mos.	1,651	1,886,281	119,204	2,005,485	175,000	275,250	33,048	649,855	1,210,260	75.1	326,317	170,933	23,514
Clinchfield Railroad..... Sept. 9 mos.	1,652	9,085,519	1,146,596	11,084,731	1,321,213	2,027,801	300,872	5,403,669	9,743,871	87.9	1,340,860	690,685	303,058
Clinchfield Railroad..... Sept. 9 mos.	309	437,564	4,245	446,667	31,256	108,688	16,398	83,406	252,447	56.5	194,220	180,643	224,613
Colorado & Southern..... Sept. 9 mos.	309	3,726,609	34,897	3,761,506	323,438	973,000	145,870	775,834	2,330,456	61.2	1,476,637	1,338,093	1,724,282
Colorado & Southern..... Sept. 9 mos.	1,019	4,829,767	39,569	4,869,336	84,733	96,879	11,348	207,518	434,912	75.6	1,404,938	84,012	86,086
Fort Worth & Denver City..... Sept. 9 mos.	1,019	3,629,227	255,059	4,301,294	682,059	896,127	113,547	1,764,511	3,763,113	87.5	538,181	43,986	183,426
Columbus & Greenville..... Sept. 9 mos.	804	393,200	49,453	514,560	50,350	75,607	16,423	156,370	333,243	64.8	181,317	157,835	137,387
Columbus & Greenville..... Sept. 9 mos.	804	2,919,103	331,886	3,250,989	409,012	681,341	149,288	1,391,486	2,948,027	77.9	835,770	585,922	505,756
Columbus & Greenville..... Sept. 9 mos.	167	87,356	6,973	94,329	20,456	13,960	3,518	33,714	80,269	79.6	20,561	17,508	18,631
Delaware & Hudson..... Sept. 9 mos.	167	560,057	53,640	663,828	150,871	111,265	32,973	280,662	660,184	99.5	3,644	—20,904	—7,263
Delaware & Hudson..... Sept. 9 mos.	835	1,758,789	116,313	1,967,505	286,045	488,729	48,096	718,725	1,681,176	85.4	286,329	180,027	277,476
Delaware & Hudson..... Sept. 9 mos.	835	1,571,850	828,728	2,399,578	2,519,053	4,622,511	434,972	6,666,786	15,293,483	88.9	1,906,317	1,167,960	1,963,959
Delaware, Lackawanna & Western..... Sept. 9 mos.	992	2,793,021	543,157	3,336,178	362,647	670,723	110,990	1,654,039	2,880,929	75.7	922,406	542,235	766,828
Delaware, Lackawanna & Western..... Sept. 9 mos.	992	2,474,164	481,742	2,955,906	3,556,850	5,516,434	1,035,587	15,271,338	28,015,264	84.4	5,175,586	2,600,745	4,095,771
Denver & Rio Grande Western..... Sept. 9 mos.	2,584	1,931,404	130,346	2,061,750	251,514	426,141	46,807	678,182	1,489,129	68.7	677,397	542,185	547,787
Denver & Rio Grande Western..... Sept. 9 mos.	2,595	12,540,185	990,309	13,530,494	1,919,019	3,767,044	448,722	4,980,699	11,895,166	82.5	2,525,716	1,173,503	1,613,553
Denver & Salt Lake..... Sept. 9 mos.	232	2,487,768	3,998	2,491,766	30,063	26,512	2,035	53,893	115,601	44.2	146,183	130,183	179,850
Denver & Salt Lake..... Sept. 9 mos.	232	1,287,768	36,297	1,404,685	185,368	283,424	16,903	332,189	848,087	60.4	556,598	422,593	858,915
Detroit & Mackinac..... Sept. 9 mos.	242	60,917	2,473	70,848	7,742	11,530	878	22,685	44,842	63.3	26,006	24,265	25,240
Detroit & Mackinac..... Sept. 9 mos.	242	381,130	23,547	459,569	94,473	87,132	7,818	192,024	409,197	89.0	50,372	40,344	53,797
Detroit & Toledo Shore Line..... Sept. 9 mos.	50	286,614	.....	286,614	18,581	29,431	7,531	63,163	127,983	44.4	160,438	135,357	89,035
Detroit & Toledo Shore Line..... Sept. 9 mos.	50	2,515,990	.....	2,534,283	206,817	236,171	65,937	621,505	1,182,469	46.7	1,351,814	1,131,256	754,628
Detroit, Toledo & Ironton..... Sept. 9 mos.	472	479,122	220	699,342	58,369	65,912	10,653	107,122	254,057	51.4	239,757	201,040	99,899
Detroit, Toledo & Ironton..... Sept. 9 mos.	472	5,957,236	2,553	6,000,000	592,327	763,245	94,728	1,220,624	2,831,131	46.0	3,330,064	2,833,658	2,633,458
Duluth, Missabe & Northern..... Sept. 9 mos.	559	1,513,712	2,575	1,516,287	123,478	196,593	3,954	265,653	636,590	37.2	1,074,183	956,564	1,002,128
Duluth, Missabe & Northern..... Sept. 9 mos.	560	8,449,098	27,411	8,476,509	1,114,139	1,589,134	31,268	1,905,712	4,958,150	51.1	4,751,978	3,922,461	4,290,544
Duluth, Winnipeg & Pacific..... Sept. 9 mos.	178	84,155	1,491	85,646	25,456	22,852	1,721	37,306	91,532	103.3	—2,897	—16,300	—13,167
Duluth, Winnipeg & Pacific..... Sept. 9 mos.	178	714,904	19,034	733,938	218,884	162,984	15,607	348,310	777,685	102.5	—18,975	—138,990	—48,557
Elgin, Joliet & Eastern..... Sept. 9 mos.	438	948,997	17	949,014	12,688	28,189	1,314	413,525	844,893	76.1	265,189	172,960	248,645
Elgin, Joliet & Eastern..... Sept. 9 mos.	442	8,970,088	31	8,970,119	1,028,887	2,221,987	119,148	3,739,731	7,406,891	72.7	2,786,762	1,980,235	1,917,531
Erie..... Sept. 9 mos.	2,304	5,722,686	399,522	6,122,208	700,006	1,112,670	161,339	2,333,116	4,509,913	69.4	2,031,397	1,695,117	892,441
Erie..... Sept. 9 mos.	2,304	4,684,232	3,683,410	8,367,642	5,525,381	10,815,882	1,483,931	20,771,298	41,018,764	71.5	13,937,663	10,913,039	8,503,238
New Jersey & New York..... Sept. 9 mos.	45	13,772	4,610	18,382	536	19,056	43,666	73,732	122,512	122.5	—13,031	—29,859	—56,286
New Jersey & New York..... Sept. 9 mos.	45	13,834	42,546	56,380	56,243	205,768	8,731	432,716	728,416	125.7	—148,789	—186,159	—319,578
New York, Susquehanna & Western..... Sept. 9 mos.	215	228,482	2,319	230,801	29,265	39,598	4,578	113,218	199,226	74.8	67,189	43,819	35,589
New York, Susquehanna & Western..... Sept. 9 mos.	215	2,329,337	224,184	2,553,521	236,080	461,790	42,762	1,099,096	1,935,684	72.5	740,482	532,712	390,772
Florida East Coast..... Sept. 9 mos.	718	2,165,595	70,006	2,235,601	108,247	113,026	16,452	1,151,282	437,266	130.2	—101,309	—176,430	—195,186
Florida East Coast..... Sept. 9 mos.	801	3,368,248	1,626,692	5,000,940	1,097,858	1,223,880	187,881	2,114,986	5,093,710	85.4	870,437	235,055	133,369
Fort Smith & Western..... Sept. 9 mos.	249	53,894	1,509	58,383	14,736	7,636	5,191	18,409	50,091	85.8	8,292	6,769	5,984
Fort Smith & Western..... Sept. 9 mos.	249	424,938	8,893	462,546	131,568	70,095	47,752	168,113	327,216	100.1	—15,193	—64,636	—23,295
Georgia Railroad..... Sept. 9 mos.	329	2,587,595	15,414	2,603,009	233,495	23,287	17,087	111,703	292,697	75.6	71,857	67,232	62,134
Georgia Railroad..... Sept. 9 mos.	329	2,049,942	124,311	2,377,355	233,495	466,541	151,875	1,034,943	1,993,811	83.9	383,344	341,837	356,352
Georgia & Florida..... Sept. 9 mos.	408	77,635	3,275	84,783	18,482	18,875	7,450	32,423	82,726	97.6	2,087	—2,773	—9,242
Georgia & Florida..... Sept. 9 mos.	408	783,919	21,535	839,940	190,606	246,771	70,637	300,406	759,723	90.5	80,217	38,760	25,338
Grand Trunk Western..... Sept. 9 mos.	1,006	1,450,476	83,338	1,533,814	248,180	286,110	32,418	641,723	1,253,304	78.6	552,076	228,500	194,851
Grand Trunk Western..... Sept. 9 mos.	1,006	13,404,162	583,061	15,045,354	2,115,911	3,078,444	292,345	6,172,116	12,310,559	81.8	2,734,795	2,056,702	1,064,516
Canadian Nat'l Lines in New Eng. Sept. 9 mos.	172	90,538	8,492	99,030	30,805	19,143	2,550	52,839	114,380	105.7	—6,171	—17,465	—52,001
Canadian Nat'l Lines in New Eng. Sept. 9 mos.	172	716,368	65,667	835,381	231,672	197,395	22,228	514,339	1,043,775	122.0	—188,394	—290,081	—600,050
Great Northern..... Sept. 9 mos.	8,250	9,359,410	386,387	9,745,797	1,136,843	1,364,843	168,398	2,611,040	5,051,459	48.3	5,412,327	4,600,879	5,688,259
Great Northern..... Sept. 9 mos.	8,287	49,931,583	3,278,792	58,067,260	5,418,155	9,249,896	1,531,049	18,744,348	36,852,599	63.4	21,241,661	16,032,891	8,872,896
Green Bay & Western..... Sept. 9 mos.	234	114,647	1,114	122,479	11,449	31,280	5,144	41,812	93,188	76.0	29,291	22,277	20,661
Green Bay & Western..... Sept. 9 mos.	234	565,239	4,723	570,000	200,868	167,347	49,235	379,938	820,144	78.5	233,892	160,751	12,653
Gulf & Ship Island..... Sept. 9 mos.	259	89,201	8,290	97,116	14,826	11,844	2,899	87,907	107,901	78.0	24,856	10,791	5,784
Gulf & Ship Island..... Sept. 9 mos.	259	749,116	78,403	827,519	133,909	145,249	26,352	468,201	818,331	84.2	153,270	—57,259	—20,370
Gulf, Mobile & Northern..... Sept. 9 mos.	936	526,311	23,814	574,159	72,509	91,071	27,499	143,800	358,218	62.99	215,941	182,288	8,008
Gulf, Mobile & Northern..... Sept. 9 mos.	936	4,044,960	191,000	4,424,967	546,466	679,417	290,667	1,308,626	2,900,850	67.57	1,434,111	1,149,601	346,382
Illinois Central..... Sept. 9 mos.	4,980	6,074,224	657,164	7,254,331	750,674	1,541,265	192,017	2,586,192	5,429,552	74.9	1,824,379	1,412,122	1,333,330
Illinois Central..... Sept. 9 mos.	4,980	50,755,994	5,835,541	61,851,297	6,048,200	14,659,822	1,777,149	23,842,536	49,666,550	80.3	12,164,747	8,162,966	12,349,495

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Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income		
		Freight	Passenger	Total	Way and structures	Equipment	Traffic			Operating income	After depr. & retir. 1935	Before depr. & ret. 1934
Yazoo & Mississippi Valley.....	1,635	\$1,168,931	\$85,313	\$1,254,244	1,097,726	151,518	152,508	60.7	\$226,518	\$412,668	\$321,334	\$226,518
Illinois Central System.....	6,616	7,243,155	742,477	7,985,632	6,879,208	1,106,424	2,106,424	72.6	2,018,556	1,818,947	1,659,664	1,818,947
Illinois Terminal	325	383,614	64,151	447,765	60,940	16,059	16,275	62.60	181,783	153,785	136,110	153,785
Kansas City Southern.....	878	2,968,986	18,282	2,987,268	2,586,844	400,424	400,424	68.87	1,396,819	937,073	817,339	937,073
Kansas.....	326	1,400,856	3,767	1,404,623	1,217,113	187,510	187,510	66.3	1,217,113	1,030,100	913,667	1,030,100
Lake Superior & Ishpeming.....	160	1,415,490	1,020	1,416,510	1,235,567	180,943	180,943	72.6	1,235,567	1,054,600	924,141	1,054,600
Kansas, Oklahoma & Gulf.....	326	1,400,856	3,767	1,404,623	1,217,113	187,510	187,510	66.3	1,217,113	1,030,100	913,667	1,030,100
Lehigh & Hudson River.....	96	1,217,761	265	1,218,026	1,097,726	120,300	120,300	63.7	1,097,726	977,414	877,414	977,414
Lehigh & New England.....	219	2,846,511	2,467	2,848,978	2,586,844	262,134	262,134	76.4	2,586,844	2,324,710	2,142,710	2,324,710
Lehigh Valley	1,339	2,833,862	187,538	3,021,400	2,586,844	434,556	434,556	74.4	1,434,556	1,197,272	1,062,097	1,197,272
Louisiana & Arkansas.....	608	3,150,327	82,034	3,232,361	2,586,844	645,517	645,517	77.0	2,586,844	2,324,710	2,142,710	2,324,710
Louisiana, Arkansas & Texas.....	255	76,290	247	76,537	67,907	8,630	8,630	76.2	67,907	60,325	53,431	60,325
Louisville & Nashville.....	5,046	5,873,514	467,041	6,340,555	5,389,376	951,179	951,179	78.8	5,389,376	4,911,525	4,531,525	4,911,525
Maine Central	1,046	700,627	78,101	778,728	658,990	119,738	119,738	75.5	658,990	569,341	519,341	569,341
Midland Valley	361	928,903	73	929,076	844,406	84,670	84,670	75.2	844,406	759,319	684,319	759,319
Minneapolis & St. Louis.....	1,625	726,486	14,692	741,178	658,990	82,188	82,188	76.8	658,990	601,588	551,588	601,588
Minneapolis, St. Paul & S. S. Marie.....	4,296	2,843,031	100,212	2,943,243	2,586,844	356,399	356,399	86.5	2,586,844	2,230,445	2,074,445	2,230,445
Duluth, South Shore & Atlantic.....	556	220,438	11,238	231,676	204,299	27,377	27,377	59.2	204,299	181,957	164,459	181,957
Spokane International	163	367,231	15,594	382,825	338,101	44,724	44,724	89.9	338,101	303,337	274,876	303,337
Mississippi Central	150	64,457	2,071	66,528	53,084	13,444	13,444	77.2	53,084	46,843	41,843	46,843
Missouri-Arkansas	364	391,581	7,983	399,564	338,101	61,463	61,463	84.1	338,101	296,666	261,666	296,666
Missouri Illinois	208	89,452	1,151	90,603	80,094	10,509	10,509	86.6	80,094	71,163	64,624	71,163
Missouri-Kansas-Texas Lines	3,293	2,063,592	161,687	2,225,279	1,940,599	284,680	284,680	81.0	1,940,599	1,755,918	1,580,918	1,755,918
Missouri Pacific	7,230	5,788,357	370,366	6,158,723	5,194,708	964,015	964,015	76.9	5,194,708	4,767,889	4,332,640	4,767,889
Gulf Coast Lines.....	1,763	642,899	288,204	931,103	815,469	115,634	115,634	87.3	815,469	723,399	652,399	723,399
International-Great Northern	1,154	732,585	61,331	793,916	708,660	85,256	85,256	86.02	708,660	623,266	553,266	623,266
Mobile & Ohio.....	1,201	6,920,942	34,045	6,954,987	6,045,533	909,454	909,454	82.88	6,045,533	5,136,419	4,611,419	5,136,419
Monongahela	174	262,880	452	263,332	237,707	25,625	25,625	42.4	237,707	212,418	192,418	212,418
Montour	57	1,443,353	1,443,353	1,268,898	174,455	174,455	56.4	1,268,898	1,094,464	980,464	1,094,464

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NOTCHING UP OR DOWN?

THERE is a certain point in business volume, under which any concern must operate in the red. But past this point, any increase in business volume should be reflected in a commensurate profit, provided, of course, that the operating ratio does not go up disproportionately. Quite often, if not always, such a rise in the operating ratio is due to obsolete equipment. . . One can go only just so far and so long in making the old equipment do. Past a certain point, increased business means only an opportunity for just getting by — in other words, just prolonging the inevitable. . . So watch that operating ratio. Is it notching-up, or notching-down? You might think and honestly believe that your equipment is good enough. Your operating ratio, going-up or going-down, will be your check. . . Incidentally, it is becoming almost a daily occurrence for our newspapers to report some aggressive industrialist as actively preparing for a return of prosperity. One corporation alone recently announced a program calling for the expenditure of over 100,000,000 dollars. . . Leadership has always gone to concerns having the most efficient equipment.



AMERICAN LOCOMOTIVE COMPANY

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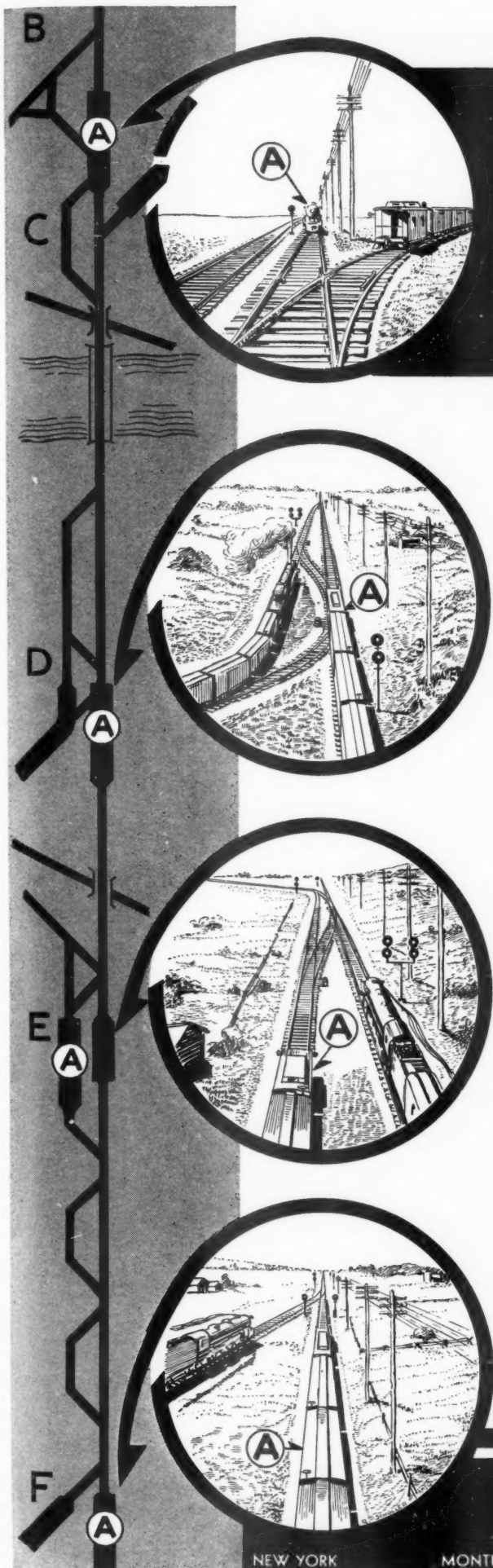
30 CHURCH STREET NEW YORK N.Y.

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1935—CONTINUED

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1935														
Av. mileage operated during period	Name of road	Operating revenues			Maintenance of way and structures			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger (inc. misc.)	Total	Way and structures	Maintenance of equipment	Traffic	Trans- portation	Total	Operating income			After deprec. & retir. 1935	Before deprec. & retir. 1935
1,154	Nashville, Chattanooga & St. Louis.....	\$792,441	\$79,079	\$871,520	\$127,613	\$222,711	\$54,364	\$398,337	\$862,828	88.2	\$115,909	\$73,541	\$71,715	\$116,074
1,180	Nashville, Chattanooga & St. Louis.....	7,394,498	703,863	8,098,361	1,240,658	2,232,212	521,423	3,786,949	8,335,517	91.4	785,261	452,085	262,828	824,986
1,65	Nevada Northern.....	35,574	1,228	36,802	1,488,839	3,964	8,615	8,615	27,424	65.3	14,571	11,285	14,582	15,530
165	Nevada Northern.....	233,671	6,894	240,565	79,446	29,574	6,694	70,134	217,851	77.4	63,600	8,566	42,227	50,761
11,364	New York Central.....	18,666,605	4,909,329	23,575,934	2,944,635	5,056,184	546,048	9,592,021	19,538,928	73.0	7,211,600	5,134,562	3,810,178	5,195,424
11,364	New York Central.....	158,515,096	40,849,734	199,364,830	22,808,406	47,256,969	4,806,745	86,022,602	173,182,670	76.6	52,837,062	35,542,775	24,061,602	36,545,385
233	Pittsburgh & Lake Erie.....	1,447,161	43,270	1,490,431	210,690	468,202	25,310	452,859	9,831,403	80.4	302,128	193,602	324,992	476,927
233	Pittsburgh & Lake Erie.....	11,604,849	393,462	12,000,311	1,100,788	3,678,941	237,309	4,121,307	9,831,403	79.4	2,547,340	1,587,238	2,885,396	4,253,446
1,691	New York, Chicago & St. Louis.....	2,825,386	90,577	2,915,963	340,386	392,375	105,473	958,009	1,915,276	63.5	1,101,704	998,499	721,752	856,670
2,072	New York, Chicago & St. Louis.....	23,385,126	612,842	24,000,000	2,699,947	3,684,783	952,220	8,682,586	17,128,440	68.8	7,756,735	6,729,148	4,470,175	4,362,305
2,072	New York, New Haven & Hartford.....	3,376,191	1,878,100	5,254,291	626,900	1,048,359	84,289	2,282,074	4,293,184	72.3	1,644,828	1,263,559	713,722	285,577
2,070	New York, New Haven & Hartford.....	30,026,170	16,332,825	46,359,000	5,593,574	8,781,874	773,198	20,553,122	38,489,923	73.6	13,787,098	10,834,224	6,143,173	4,303,518
20	New York Connecting.....	218,555	.....	218,555	12,393	6,609	.....	26,821	46,833	20.2	184,447	150,517	116,646	116,646
20	New York Connecting.....	1,978,854	.....	1,978,854	111,729	62,645	.....	293,012	476,202	23.5	1,549,357	1,243,227	935,044	935,044
567	New York, Ontario & Western.....	5,509,171	26,122	5,535,293	99,161	122,103	10,869	2,707,634	4,872,998	80.7	128,288	96,120	62,792	80,572
567	New York, Ontario & Western.....	5,509,171	26,122	5,535,293	708,370	1,123,474	103,079	2,707,634	4,872,998	75.9	1,547,684	1,215,631	882,807	1,005,892
2,166	Norfolk & Western.....	6,431,283	176,393	6,607,676	767,928	1,046,633	116,596	1,445,540	3,568,350	52.4	3,236,653	2,522,615	2,755,243	1,601,548
2,169	Norfolk & Western.....	52,569,687	1,346,912	53,916,599	6,372,006	10,948,472	1,078,301	13,199,802	33,323,265	59.7	22,484,416	16,214,415	17,854,968	16,374,981
932	Norfolk Southern.....	3,275,011	12,044	3,287,055	69,065	55,078	20,934	144,432	310,840	85.4	53,310	27,567	6,700	16,033
932	Norfolk Southern.....	3,275,011	12,044	3,287,055	652,823	477,445	194,837	1,326,835	2,803,136	79.3	729,987	495,261	257,271	459,677
6,722	Northern Pacific.....	5,377,948	303,918	5,681,866	549,090	1,041,146	154,929	1,795,777	3,799,154	61.8	2,344,799	1,860,486	2,035,713	1,179,287
6,726	Northern Pacific.....	31,990,987	2,636,628	34,627,615	4,956,054	9,194,547	1,423,186	15,069,140	33,416,466	87.2	4,909,824	8,282,311	3,273,454	5,364,519
375	Northwestern Pacific.....	1,461,032	81,703	1,542,735	337,556	446,541	36,899	1,369,947	2,315,422	94.1	145,654	7,327	12,854	4,129
375	Northwestern Pacific.....	1,461,032	81,703	1,542,735	337,556	446,541	36,899	1,369,947	2,315,422	94.1	145,654	7,327	12,854	4,129
132	Oklahoma City-Ada-Atoka.....	26,599	323	26,922	5,748	4,693	810	10,368	21,583	74.8	7,290	4,929	1,339	3,486
132	Oklahoma City-Ada-Atoka.....	301,570	3,067	304,637	70,320	17,076	7,075	97,621	204,548	63.0	120,216	103,535	39,071	39,145
10,473	Pennsylvania.....	23,005,861	5,101,604	28,107,465	3,042,889	5,537,364	581,308	10,481,913	21,407,801	68.7	9,731,840	7,161,885	6,526,328	5,005,709
10,473	Pennsylvania.....	199,173,471	44,354,549	243,528,020	24,426,582	50,478,629	5,378,998	97,601,827	193,839,459	71.9	75,759,621	56,398,284	49,703,727	46,915,402
396	Long Island.....	435,118	1,526,939	1,962,057	158,652	338,307	16,382	899,888	1,470,480	71.3	591,547	282,701	98,863	272,845
396	Long Island.....	4,233,722	13,071,370	17,305,092	1,541,509	3,143,950	140,661	8,440,680	13,783,167	76.0	4,354,692	2,165,117	613,221	1,731,870
413	Pennsylvania-Reading Seashore Lines.....	2,001,000	2,310,297	4,311,297	50,657	785,625	79,232	2,677,854	4,298,298	94.9	232,492	232,492	558,288	181,735
413	Pennsylvania-Reading Seashore Lines.....	2,001,000	2,310,297	4,311,297	50,657	785,625	79,232	2,677,854	4,298,298	94.9	232,492	232,492	558,288	181,735
2,123	Pere Marquette.....	2,219,278	66,904	2,286,182	328,013	490,857	59,943	819,646	1,790,292	72.7	670,626	567,536	444,112	23,115
2,129	Pere Marquette.....	18,457,233	585,858	19,043,091	2,319,232	4,447,052	559,930	7,438,161	15,613,447	156.2	4,561,185	3,699,358	2,802,226	2,993,182
101	Pittsburgh & Shawmut.....	21,908	23,113	45,021	9,285	146,916	13,838	152,581	431,983	97.9	12,920	13,448	8,458	2,697
101	Pittsburgh & Shawmut.....	431,144	3,353	434,497	92,825	146,916	13,838	152,581	431,983	97.9	12,920	13,448	8,458	2,697
138	Pittsburgh & West Virginia.....	258,109	.....	258,109	33,581	53,787	14,120	52,210	174,071	63.7	99,313	78,497	108,744	131,698
138	Pittsburgh & West Virginia.....	2,037,331	.....	2,037,331	232,595	495,016	120,707	452,362	1,489,301	69.2	663,249	498,667	707,820	925,474
190	Pittsburgh, Shawmut & Northern.....	54,889	12	54,901	14,401	13,839	1,354	23,224	58,968	104.7	2,644	4,800	7,688	11,163
190	Pittsburgh, Shawmut & Northern.....	693,112	1,284	694,396	152,244	149,545	12,357	271,910	643,285	90.9	64,000	44,277	3,921	20,233
1,459	Reading.....	3,581,037	239,145	3,820,182	320,073	598,824	73,194	1,555,978	2,703,360	67.2	1,318,091	1,028,617	1,066,079	862,295
1,459	Reading.....	33,788,654	2,113,243	35,901,897	2,988,212	6,618,958	683,601	14,868,058	27,002,297	71.2	10,935,081	8,220,078	8,555,372	9,735,526
117	Richmond, Fredericksburg & Potomac.....	2,617,046	1,282,504	3,899,550	495,884	1,113,416	77,714	2,056,911	4,083,234	83.0	837,494	597,955	281,525	331,788
117	Richmond, Fredericksburg & Potomac.....	2,617,046	1,282,504	3,899,550	495,884	1,113,416	77,714	2,056,911	4,083,234	83.0	837,494	597,955	281,525	331,788
407	Rutland.....	200,425	48,032	248,457	307,531	56,677	10,678	131,148	267,740	87.1	39,791	20,019	16,616	12,920
407	Rutland.....	1,608,386	231,910	1,840,296	422,143	497,666	97,457	1,213,085	2,361,757	97.9	51,058	125,890	116,846	7,242
4,929	St. Louis-San Francisco.....	3,188,348	236,802	3,425,150	617,167	845,710	103,134	1,320,895	3,067,211	82.01	672,850	436,235	467,201	284,993
4,996	St. Louis-San Francisco.....	24,968,400	1,944,750	26,913,150	5,511,414	7,489,759	916,008	11,356,285	26,442,270	89.22	3,193,382	1,066,999	973,776	2,831,441
233	Fort Worth & Rio Grande.....	31,068	994	32,062	12,144	10,650	1,989	23,977	51,702	131.3	12,315	16,274	20,365	16,152
233	Fort Worth & Rio Grande.....	250,004	10,742	260,746	88,868	88,868	21,978	208,194	446,497	139.2	125,672	161,789	204,299	204,233
261	St. Louis, San Francisco & Texas.....	107,466	534	108,000	34,773	5,159	5,159	35,000	899,653	95.4	5,205	5,205	26,029	60,089
261	St. Louis, San Francisco & Texas.....	764,737	4,822	769,559	291,533	153,316	44,317	356,000	899,653	112.2	97,670	132,075	354,447	406,638
1,778	St. Louis Southwestern Lines.....	1,154,496	18,713	1,173,209	149,018	171,339	71,963	406,128	865,957	70.1	369,264	293,363	194,233	166,771
1,783	St. Louis Southwestern Lines.....	10,876,457	149,932	11,026,389	1,316,260	1,567,519	648,179	3,816,592	7,945,121	68.9	3,582,498	2,915,478	1,706,444	1,545,312
145	San Diego & Arizona Eastern.....	259,610	54,019	313,629	98,615	62,565	16,435	179,111	403,543	113.6	48,196	74,436	64,285	43,265

Continued on next left-hand page



C.T.C. SAVES 25 PER CENT ROAD TIME

There was no delay to any of the five trains making the four meets illustrated. "Union" Centralized Traffic Control makes it possible to handle trains at the various junctions on this busy connecting road with practically no delay because trains are moved solely under authority of signal indications and there are no delays in securing clearances and train orders. Trains spend 25 per cent less time on this section than when the train order method of operation was used. » » » » » » » » » »

"Such moves are not exceptions but occur almost daily," says the train controller in commenting on the performance of trains under C. T. C. operation. » » » » » » » » » »

1027

Union Switch & Signal Co.

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Revenues and Expenses of Railways

1935—MEMBERS OF CALENDAR YEAR 1935—CONTINUED

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